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(71) Applicant *(for all designated States except US)*: **THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES** [US/US]; National Institutes of Health, Office of Technology Transfer, Suite 325, 6011 Executive Boulevard, Rockville, MD 20852 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **MENG, Xiang-Jin** [CN/US]; 401 Craig Drive, Blacksburg, VA 24060 (US). **PURCELL, Robert, H.** [US/US]; 17517 White Grounds Road, Boyds, MD 20814 (US). **EMERSON, Suzanne, U.** [US/US]; 4517 Everett Street, Kensington, MD 20895 (US).

(74) Agent: **FEILER, William, S.**; Morgan & Finnegan, L.L.P., 345 Park Avenue, New York, NY 10154 (US).

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(54) Title: RECOMBINANT ORF2 PROTEINS OF THE SWINE HEPATITIS E VIRUS AND THEIR USE AS A VACCINE AND AS A DIAGNOSTIC REAGENT FOR MEDICAL AND VETERINARY APPLICATIONS

(57) Abstract: The invention relates to open reading frame 2 (ORF-2) proteins of a swine hepatitis E virus and the use of these proteins as an antigen in diagnostic immunoassays and/or as immunogen or vaccine to protect against infection by hepatitis E.

TITLE OF INVENTION

Recombinant ORF2 proteins of the swine hepatitis E virus and their use as a vaccine and as a diagnostic reagent for medical and veterinary applications.

FIELD OF INVENTION

The invention is in the field of hepatitis virology. More specifically, this invention relates to recombinant ORF2 proteins derived from a swine hepatitis E virus and to diagnostic methods and vaccine applications which employ these proteins.

BACKGROUND OF INVENTION

Hepatitis E virus (HEV), the causative agent of hepatitis E, is an important public health problem in developing countries. Most global public health organizations consider hepatitis E to be the major cause of acute viral hepatitis in young adults in regions where sanitation conditions are poor. The mortality rate of HEV infection is generally low, but was reportedly up to 20% in patients infected during pregnancy. In the United States, two cases of acute hepatitis E not associated with travel to present regions have been recently reported, and hepatitis E is now considered to be endemic in the United States. A vaccine for hepatitis E is not available yet. The first animal strain of HEV, swine hepatitis E virus (swine HEV), was recently identified and found to be ubiquitous in the general pig population in the United States and other countries, and to experimentally infect non-human primates, the surrogates of humans. The complete genome of swine HEV, including the putative capsid gene (ORF2), has been sequenced.

The possibility that swine HEV may infect humans raises a potential public health concern for zoonosis or xenozoonosis in the United States and perhaps other countries. Therefore, diagnostic reagents based on recombinant proteins of swine HEV will be very useful in screening donor pigs used in xenotransplantation and in detecting swine HEV or similar virus infection in humans. The diagnostic reagents may also be useful for veterinary studies and monitoring pig herds in general. A vaccine based on the recombinant capsid protein of swine HEV might also

be useful in protecting humans against zoonotic and other HEV infections and pigs against infection with the swine HEV.

SUMMARY OF INVENTION

The invention relates to isolated and substantially purified open reading frame 2 proteins encoded by the swine HEV genome and in particular to a recombinantly produced ORF2 protein consisting of amino acids 112-602 of the swine ORF2.

It is therefore an object of this invention to provide synthetic nucleic acid sequences capable of directing production of these recombinant HEV proteins, as well as equivalent natural nucleic acid sequences. Such natural nucleic acid sequences may be isolated from a cDNA or genomic library from which the gene capable of directing synthesis of the HEV proteins may be identified and isolated. For purposes of this application, nucleic acid sequence refers to RNA, DNA, cDNA or any synthetic variant thereof.

The invention also relates to methods of preparing the HEV proteins by expressing the recombinant protein in a host cell.

The invention also relates to the use of the resultant recombinant HEV proteins as diagnostic agents and as vaccines.

The present invention also encompasses methods of detecting antibodies specific for swine hepatitis E virus in biological samples. Such methods are useful in diagnosis of infection and disease caused by swine HEV, and for monitoring the progression of such disease. Such methods are also useful for monitoring the efficacy of therapeutic agents during the course of treatment of HEV infection and disease in a mammal.

DETAILED DESCRIPTION OF THE FIGURES

Figures 1A and 1B show amino acid (SEQ. ID NO:1, Figure 1A) and nucleotide (SEQ. ID NO:2, Figure 1B) sequences respectively of open reading frame 2 of the swine HEV of Meng et al. [Proc Natl Acad. Sci. USA (1997) 98:9860-9865]

Figures 2A-2O show the results of EIAs, using as the antigen, either the swine ORF2 protein consisting of amino acids 112-602 of swine ORF2 (designated "swORF2" in the Figures) or the human HEV ORF2 antigen consisting of amino acids 112-607 of the ORF2 of the Pakistani SAR-55 strain of HEV (designated "humSAR55" in the Figures). Anti-HEV antibody levels were measured in serum from swine obtained from the United States (Iowa), China, Thailand, Canada and Korea (Figures 2A-2N) and the results of the EIAs with the swORF2 and humSAR55 antigens are summarized in Figure 2O. In Figures 2A-2N a sample was considered positive if the ratio (see column headed "sample/coff") of the optical density measured for the human SAR55 ("humSAR55" column) or swine antigens ("swORF2" column) to the cutoff value (see columns headed "cutoff") for the humSAR55 or swORF2 antigens was greater than 1.0.

Figures 3A-3R show the results of EIAs using as the antigen, either the swine ORF2 protein consisting of amino acids 112-602 of swine ORF2 (designated "swORF2" in the Figures) or the human HEV ORF2 antigen consisting of amino acids 112-607 of the ORF2 of the Pakistani SAR-55 strain of HEV. (designated "humSAR55" in the Figures). Anti-HEV antibody levels were measured in human serum samples. In the Figures the designation "Thai PH" refers to samples from Thai pig handlers, the designation "Chi PH" refers to samples from Chinese pig handlers, the designation "Chin BD" refers to samples from Chinese blood donors, the designation "Lcl BD" refers to samples from US blood donors and the designation "XJPH" refers to samples from US pig handlers. In Figures 3A-3Q, a sample was considered positive if the ratio (see column headed "sample/coff") of the optical density measured for the human SAR55 ("humSAR55" column) or swine antigens ("swORF2" column) to the cutoff value (see columns headed "coff") for the humSAR55 or swORF2 antigens was greater than 1.0.

Figure 4 shows an anti-HEV IgG response time course of two chimpanzees experimentally infected with the Sar-55 strain as determined by EIAs using capsid antigens generated from the human and swine HEV strains. The values are expressed as Sample over Cut-off ratios and 1.0 is the positive baseline.

Figure 5 shows an anti-HEV IgG response time course of two rhesus monkeys experimentally infected with the genotype 2 Mexican strain as determined by EIAs using capsid antigens generated from the Sar-55 and Meng HEV strains.

DETAILED DESCRIPTION OF INVENTION

The swine hepatitis E virus open reading frame 2 (sHEV ORF2) capsid antigen is structurally very similar to the human HEV ORF2 gene product. Of course, it is not clear whether swine HEV evolved into human HEV, or vice versa, or whether they diverged from a common ancestor. Regardless of lineage, the possibility that swine HEV could infect humans raises a potential public health concern for zoonosis or xenozoonosis, especially since xenotransplantation of pig organs has been suggested as a solution to the solid organ donor shortage for transplantations. Thus, xenozoonoses, the inadvertent transmission of pathogens from animal organs to human recipients, is of major concern. Viruses pathogenic for pigs might pose a risk to humans. However, nonpathogenic pig viruses may also become pathogenic for humans after xenotransplantation, as a result of species-jumping, recombination or adaptation in immunocompromised xenotransplantation recipients. Furthermore, pigs recovered from swine HEV infection might have a damaged liver (or other organ) which would limit usefulness for xenotransplantation.

Because of these and other potential public health concerns, it would be highly advantageous to have a swine HEV ORF2 antigen that is sufficiently closely related to human HEV to allow evaluation as a potential source of infection in humans.

The full-length sHEV ORF2 protein product is predicted to contain 660 amino acids and to weigh 71,000 daltons. Example 3 discloses that expression of the sHEV ORF2 capsid gene from recombinant baculoviruses in insect cells produces multiple HEV capsid polypeptides, including a set of major proteins with molecular weights of 71, 63, and 55 kD. The present invention relates to these proteins and in particular, to the most abundant of these proteins, the 55 kD protein, which is present primarily within the cell by 24 hr. post-infection though a minor fraction of the 55 kD protein is secreted. Amino acid 112 of the full-length sHEV ORF2 is located at the amino terminus of the 55 kD protein as determined by N-terminal sequence analysis.

Amino acid 602 of the full-length sHEV ORF2 is located at the carboxy terminus of the 55 kD protein as determined by C-terminal sequence analysis. The present invention therefore relates to nucleic acid molecules which encode this 55 kilodalton swine HEV ORF2 protein. Such nucleic acid molecules can be selected from sequences which encode the swine HEV ORF2 protein sequence shown in Figure 1A as SEQ. ID NO:1. Preferred nucleic acid sequences are those obtained from the nucleotide sequence of the swine HEV ORF2 shown in Figure 1B as SEQ. ID NO:2. In one embodiment, the nucleic acid molecule encodes the full-length 660 amino acid ORF2 protein as described in Example 2. Alternatively, the nucleic acid molecule may consist of nucleotides which encode amino acids 112-602 of ORF2 (i.e., nucleotides 334 to 1806 of SEQ. ID NO:2).

Such nucleic acid molecules may be inserted into any vector suitable for expression in prokaryotic or eukaryotic cells. Such vectors include any vectors into which a nucleic acid sequence as described above can be inserted, along with any preferred or required operational elements, and which vector can then be subsequently transferred into a host organism and replicated in such organism. Preferred vectors are those whose restriction sites have been well documented and which contain the operational elements preferred or required for transcription of the nucleic acid sequence.

The "operational elements" as discussed herein include at least one promoter, at least one operator, at least one leader sequence, at least one terminator codon, and any other DNA sequences necessary or preferred for appropriate transcription and subsequent translation of the vector nucleic acid. In particular, it is contemplated that such vectors will contain at least one origin of replication recognized by the host organism along with at least one selectable marker and at least one promoter sequence capable of initiating transcription of the nucleic acid sequence.

In construction of the vector of the present invention, it should additionally be noted that multiple copies of the nucleic acid sequence and its attendant operational elements may be inserted into each vector. In such an embodiment, the host organism would produce greater amounts per vector of the desired HEV protein. The number of multiple copies of the DNA sequence which may

be inserted into the vector is limited only by the ability of the resultant vector due to its size, to be transferred into and replicated and transcribed in an appropriate host microorganism.

Preferred expression vectors are those that function in a eukaryotic cell. Examples of such vectors include but are not limited to baculovirus transfer vectors.

The selected recombinant expression vector may then be transfected into a suitable eukaryotic cell system for purposes of expressing the recombinant protein. Preferred cell systems for expression are eukaryotic cells. Such eukaryotic cell systems include, but are not limited to, yeast, insect cells and cell lines such as HeLa, MRC5 or Cv1.

The expressed recombinant protein may be detected by methods known in the art which include SDS-PAGE and Western blotting using sera containing anti-HEV antibody as described in Example 3.

The recombinant protein expressed by the SF9 cells can be obtained as a crude lysate or it can be purified by standard protein purification procedures known in the art which may include differential precipitation, molecular sieve chromatography, ion-exchange chromatography, isoelectric focusing, gel electrophoresis, affinity, and immunoaffinity chromatography and the like. In the case of immunoaffinity chromatography, the recombinant protein may be purified by passage through a column containing a resin which has bound thereto antibodies specific for the ORF protein. An example of a protocol for the purification of the recombinantly expressed 55 kilodalton swine HEV ORF protein is provided in Example 4.

In another embodiment, the expressed recombinant proteins of this invention can be used in immunoassays for the diagnosis or prognosis of hepatitis E in a mammal including, but not limited to, swine and humans. Such assays could be used for detection of swine HEV or similar virus infection in humans, for monitoring pig herds in general, and for risk assessment of swine HEV infection in xenotransplantation using pig organs. In a preferred embodiment, the immunoassay is useful in diagnosing infection of humans and swine with swine hepatitis E. Immunoassays using the swine HEV proteins of the invention therefore provide a highly specific reproducible method for diagnosing swine HEV infections.

Immunoassays of the present invention may be a radioimmunoassay, Western blot assay, immunofluorescent assay, enzyme immunoassay, chemiluminescent assay, immunohistochemical assay and the like. Standard techniques known in the art for EIA are described in Methods in Immunodiagnosis, 2nd Edition, Rose and Bigazzi, eds., John Wiley and Sons, 1980 and Campbell et al., Methods of Immunology, W.A. Benjamin, Inc., 1964, both of which are incorporated herein by reference. Such assays may be a direct, indirect, competitive, or noncompetitive immunoassay as described in the art. (Oellerich, M. 1984. J.Clin. Chem. Clin. BioChem. 22: 895904) Biological samples appropriate for such detection assays include, but are not limited to, tissue biopsy extracts, whole blood, plasma, serum, cerebrospinal fluid, pleural fluid, urine and the like.

In one embodiment, test serum is reacted with a solid phase reagent having surface-bound recombinant swine HEV ORF2 protein as an antigen, preferably, the HEV protein is the swine ORF2 protein consisting of amino acids 112-602 of SEQ. ID NO:1. The solid surface reagent can be prepared by known techniques for attaching protein to solid support material. These attachment methods include nonspecific adsorption of the protein to the support or covalent attachment of the protein to a reactive group on the support. After reaction of the antigen with anti-HEV antibody, unbound serum components are removed by washing and the antigen-antibody complex is reacted with a secondary antibody such as labelled antihuman antibody. The label may be an enzyme which is detected by incubating the solid support in the presence of a suitable fluorimetric or colorimetric reagent. Other detectable labels may also be used, such as radiolabels or colloidal gold, and the like.

In one embodiment, protein expressed by a recombinant baculovirus vector containing the entire ORF2 sequence of swine HEV is used as a specific binding agent to detect anti-HEV antibodies, preferably IgG or IgM antibodies. Figures 2 and 3 show the results of EIAs in which the solid phase reagent has the recombinant swine ORF2 protein consisting of amino acids 112-602 as the surface antigen.

The HEV protein and analogs may be prepared in the form of a kit, alone, or in combinations with other reagents such as secondary antibodies, for use in immunoassays.

The recombinant HEV proteins can be used as a vaccine to protect mammals against challenge with hepatitis E derived from human, swine or other species. The vaccine, which acts as an immunogen, may be a cell, cell lysate from cells transfected with a recombinant expression vector or a culture supernatant containing the expressed protein. Alternatively, the immunogen is a partially or substantially purified recombinant protein. While it is possible for the immunogen to be administered in a pure or substantially pure form, it is preferable to present it as a pharmaceutical composition, formulation or preparation.

The formulations of the present invention, both for veterinary and for human use, comprise an immunogen as described above, together with one or more pharmaceutically acceptable carriers and optionally other therapeutic ingredients. The carrier(s) must be "acceptable" in the sense of being compatible with the other ingredients of the formulation and not deleterious to the recipient thereof. The formulations may conveniently be presented in unit dosage form and may be prepared by any method well-known in the pharmaceutical art.

All methods include the step of bringing into association the active ingredient with the carrier which constitutes one or more accessory ingredients. In general, the formulations are prepared by uniformly and intimately bringing into association the active ingredient with liquid carriers or finely divided solid carriers or both, and then, if necessary, shaping the product into the desired formulation.

Formulations suitable for intravenous intramuscular, subcutaneous, or intraperitoneal administration conveniently comprise sterile aqueous solutions of the active ingredient with solutions which are preferably isotonic with the blood of the recipient. Such formulations may be conveniently prepared by dissolving solid active ingredient in water containing physiologically compatible substances such as sodium chloride (e.g. 0.1-2.0M), glycine, and the like, and having a buffered pH compatible with physiological conditions to produce an aqueous solution, and rendering said solution sterile. These may be present in unit or multidose containers, for example, sealed ampoules or vials.

The formulations of the present invention may incorporate a stabilizer. Illustrative stabilizers are polyethylene glycol, proteins, saccharides, amino acids, inorganic acids, and organic acids which may be used either on their own or as

admixtures. These stabilizers are preferably incorporated in an amount of 0.1 to 1:10,000 parts by weight per part by weight of immunogen. If two or more stabilizers are to be used, their total amount is preferably within the range specified above. These stabilizers are used in aqueous solutions at the appropriate concentration and pH. The specific osmotic pressure of such aqueous solutions is generally in the range of 0.1-3.0 osmoles, preferably in the range of 0.8-1.2. The pH of the aqueous solution is adjusted to be within the range of 5.0-9.0, preferably within the range of 6-8. In formulating the immunogen of the present invention, an anti-adsorption agent may be used.

Additional pharmaceutical methods may be employed to control the duration of action. Controlled release preparations may be achieved through the use of polymer to complex or absorb the proteins or their derivatives. The controlled delivery may be exercised by selecting appropriate macromolecules (for example polyester, polyamino acids, polyvinyl, pyrrolidone, ethylenevinylacetate, methylcellulose, carboxymethylcellulose, or protamine sulfate) and the concentration of macromolecules as well as the methods of incorporation in order to control release. Another possible method to control the duration of action by controlled release preparations is to incorporate the proteins, protein analogs or their functional derivatives, into particles of a polymeric material such as polyesters, polyamino acids, hydrogels, poly(lactic acid) or ethylene vinylacetate copolymers. Alternatively, instead of incorporating these agents into polymeric particles, it is possible to entrap these materials in microcapsules prepared, for example, by coacervation techniques or by interfacial polymerization, for example, hydroxymethylcellulose or gelatin microcapsules and poly(methylmethacylate) microcapsules, respectively, or in colloidal drug delivery systems, for example, liposomes, albumin microspheres, microemulsions, nanoparticles, and nanocapsules or in macroemulsions.

When oral preparations are desired, the compositions may be combined with typical carriers, such as lactose, sucrose, starch, talc magnesium stearate, crystalline cellulose, methyl cellulose, carboxymethyl cellulose, glycerin, sodium alginate or gum arabic among others.

The proteins of the present invention may be supplied in the form of a kit, alone, or in the form of a pharmaceutical composition as described above.

Vaccination can be conducted by conventional methods. For example, the immunogen can be used in a suitable diluent such as saline or water, or complete or incomplete adjuvants. Further, the immunogen may or may not be bound to a carrier to make the protein immunogenic. Examples of such carrier molecules include but are not limited to bovine serum albumin (BSA), keyhole limpet hemocyanin (KLH), tetanus toxoid, and the like. The immunogen can be administered by any route appropriate for antibody production such as intravenous, intraperitoneal, intramuscular, subcutaneous, and the like. The immunogen may be administered once or at periodic intervals until a significant titer of anti-HEV antibody is produced. The antibody may be detected in the serum using an immunoassay.

In yet another embodiment, the immunogen may be nucleic acid sequence capable of directing host organism synthesis of an HEV ORF protein. Such nucleic acid sequence may be inserted into a suitable expression vector by methods known to those skilled in the art. Expression vectors suitable for producing high efficiency gene transfer in vivo include, but are not limited to, retroviral, adenoviral and vaccinia viral vectors. Operational elements of such expression vectors are disclosed previously in the present specification and are known to one skilled in the art. Such expression vectors can be administered intravenously, intramuscularly, subcutaneously, intraperitoneally or orally.

In an alternative embodiment, direct gene transfer may be accomplished via intramuscular injection of, for example, plasmid-based eukaryotic expression vectors containing a nucleic acid sequence capable of directing host organism synthesis of HEV ORF protein(s). Such an approach has previously been utilized to produce the hepatitis B surface antigen in vivo and resulted in an antibody response to the surface antigen (Davis, H.L. et al. (1993) Human Molecular Genetics, 2:1847-1851; see also Davis et al. (1993) Human Gene Therapy, 4:151-159 and 733-740).

When the immunogen is a partially or substantially purified recombinant swine HEV ORF2 protein, dosages effective to elicit a protective antibody response against HEV range from about 0.5μg to about 50μg. A more preferred range is from about 1μg to about 30μg and a most preferred range is from about 5μg to about 20μg.

Dosages of swine HEV ORF2 protein-encoding nucleic acid sequence effective to elicit a protective antibody response against HEV range from about 1 to about 5000 µg; a more preferred range being about 300 to about 1000 µg.

The expression vectors containing a nucleic acid sequence capable of directing host organism synthesis of a swine HEV ORF2 protein(s) may be supplied in the form of a kit, alone, or in the form of a pharmaceutical composition as described above.

The administration of the immunogen of the present invention may be for either a prophylactic or therapeutic purpose. When provided prophylactically, the immunogen is provided in advance of any exposure to HEV or in advance of any symptom due to HEV infection. The prophylactic administration of the immunogen serves to prevent or attenuate any subsequent infection of HEV in a mammal. When provided therapeutically, the immunogen is provided at (or shortly after) the onset of the infection or at the onset of any symptom of infection or disease caused by HEV. The therapeutic administration of the immunogen serves to attenuate the infection or disease.

A preferred embodiment is a vaccine prepared using the recombinant swine ORF2 protein expressed by the ORF2 sequence of swine HEV encoding amino acids 1-660 of ORF2. Since the recombinant swine ORF2 protein (112-602) has already been demonstrated to be reactive with a variety of HEV-positive sera from swine and humans (Figures 2 and 3), its utility in protecting against HEV strains is indicated.

In addition to use as a vaccine, the compositions can be used to prepare antibodies. The antibodies can be used directly as antiviral agents. To prepare antibodies, a host animal is immunized using the virus particles or, as appropriate, nonparticle antigens native to the virus particle can be administered in conjunction with an adjuvant as described above for vaccines. The host serum or plasma is collected following an appropriate time interval to provide a composition comprising antibodies reactive with the virus particle. The gamma globulin fraction or the IgG antibodies can be obtained, for example, by use of saturated ammonium sulfate or DEAE Sephadex, or other techniques known to those skilled in the art. The

antibodies are substantially free of many of the adverse side effects which may be associated with other antiviral agents such as drugs.

The antibody compositions can be made even more compatible with the host system by minimizing potential adverse immune system responses. This is accomplished by removing all or a portion of the Fc portion of a foreign species antibody or using an antibody of the same species as the host animal, for example, the use of antibodies from human/human hybridomas. Humanized antibodies (i.e., non-immunogenic in a human) may be produced, for example, by replacing an immunogenic portion of an antibody with a corresponding, but non-immunogenic portion (i.e., chimeric antibodies). Such chimeric antibodies may contain the reactive or antigen binding portion of an antibody from one species and the Fc portion of an antibody (non-immunogenic) from a different species. Examples of chimeric antibodies, include but are not limited to, non-human mammal-human chimeras, rodent-human chimeras, murine-human and rat-human chimeras (Robinson et al., International Patent Application 184,187; Taniguchi M., European Patent Application 171,496; Morrison et al., European Patent Application 173,494; Neuberger et al., PCT Application WO 86/01533; Cabilly et al., (1987) Proc. Natl. Acad. Sci. USA 84:3439; Nishimura et al., (1987) Canc. Res. 47:999; Wood et al., (1985) Nature 314:446; Shaw et al., (1988) J. Natl. Cancer Inst. 80: 15553, all incorporated herein by reference).

General reviews of "humanized" chimeric antibodies are provided by Morrison S., (1985) Science 229:1202 and by Oi et al., (1986) BioTechniques 4:214.

Suitable "humanized" antibodies can be alternatively produced by CDR or CEA substitution (Jones et al., (1986) Nature 321:552; Verhoeyan et al., (1988) Science 239:1534; Biedleret al. (1988) J. Immunol. 141:4053, all incorporated herein by reference).

The antibodies or antigen binding fragments may also be produced by genetic engineering. The technology for expression of both heavy and light chain genes in E. coli is the subject the PCT patent applications; publication number WO 901443, WO901443, and WO 9014424 and in Huse et al., (1989) Science 246:12751281.

The antibodies can also be used as a means of enhancing the immune response. The antibodies can be administered in amounts similar to those used for other therapeutic administrations of antibody. For example, pooled gamma globulin is administered at 0.02-0.1 ml/lb body weight during the early incubation period of other viral diseases such as rabies, measles and hepatitis B to interfere with viral entry into cells. Thus, antibodies reactive with the HEV virus particle can be passively administered alone or in conjunction with another antiviral agent to a host infected with an HEV to enhance the effectiveness of an antiviral drug.

Alternatively, anti-HEV antibodies can be induced by administering anti-idiotype antibodies as immunogens. Conveniently, a purified anti-HEV antibody preparation prepared as described above is used to induce anti-idiotype antibody in a host animal. The composition is administered to the host animal in a suitable diluent. Following administration, usually repeated administration, the host produces anti-idiotype antibody. To eliminate an immunogenic response to the Fc region, antibodies produced by the same species as the host animal can be used or the FC region of the administered antibodies can be removed. Following induction of anti-idiotype antibody in the host animal, serum or plasma is removed to provide an antibody composition. The composition can be purified as described above for anti-HEV antibodies, or by affinity chromatography using anti-HEV antibodies bound to the affinity matrix. The anti-idiotype antibodies produced are similar in conformation to the authentic HEV antigen and may be used to prepare an HEV vaccine rather than using an HEV particle antigen.

When used as a means of inducing anti-HEV virus antibodies in an animal, the manner of injecting the antibody is the same as for vaccination purposes, namely intramuscularly, intraperitoneally, subcutaneously or the like in an effective concentration in a physiologically suitable diluent with or without adjuvant. One or more booster injections may be desirable.

The HEV-derived proteins of the invention are also intended for use in producing antiserum designed for pre or post-exposure prophylaxis. Here an HEV protein, or mixture of proteins is formulated with a suitable adjuvant and administered by injection to human volunteers, according to known methods for producing human antisera. Antibody response to the injected proteins is monitored, during a several-

week period following immunization, by periodic serum sampling to detect the presence of anti-HEV serum antibodies, using an immunoassay as described herein.

The antiserum from immunized individuals may be administered as a pre-exposure prophylactic measure for individuals who are at risk of contracting infection. The antiserum is also useful in treating an individual post-exposure, analogous to the use of high titer antiserum against hepatitis B virus for post-exposure prophylaxis. Of course, those of skill in the art would readily understand that immune globulin (HEV immune globulin) purified from the antiserum of immunized individuals using standard techniques may be used as a pre-exposure prophylactic measure or in treating individuals post-exposure.

For both in vivo use of antibodies to HEV virus-like particles and proteins and anti-idiotype antibodies and diagnostic use, it may be preferable to use monoclonal antibodies. Monoclonal anti-virus particle antibodies or anti-idiotype antibodies can be produced as follows. The spleen or lymphocytes from an immunized animal are removed and immortalized or used to prepare hybridomas by methods known to those skilled in the art. (Goding, J.W. 1983. Monoclonal Antibodies: Principles and Practice, Pladermic Press, Inc., NY, NY, pp. 5697). To produce a human-human hybridoma, a human lymphocyte donor is selected. A donor known to be infected with HEV (where infection has been shown for example by the presence of anti-virus antibodies in the blood or by virus culture) may serve as a suitable lymphocyte donor. Lymphocytes can be isolated from a peripheral blood sample or spleen cells may be used if the donor is subject to splenectomy. EpsteinBarr virus (EBV) can be used to immortalize human lymphocytes or a human fusion partner can be used to produce humanhuman hybridomas. Primary in vitro immunization with peptides can also be used in the generation of human monoclonal antibodies.

Antibodies secreted by the immortalized cells are screened to determine the clones that secrete antibodies of the desired specificity. For monoclonal anti-virus particle antibodies, the antibodies must bind to HEV virus particles. For monoclonal anti-idiotype antibodies, the antibodies must bind to anti-virus particle antibodies. Cells producing antibodies of the desired specificity are selected.

In another embodiment, antibody phage display libraries can be constructed from variable heavy and light chain antibody genes using a phage display vector specifically designed for the expression of antibody fragments to an antigen (Winter et al., (1994) An . Rev. Immunol. 12:433-55; de Kruif et al., (1996) Immunol. Today 17: 453-5; Burton et al., (1994) Science 266:1024-7). From such libraries, large numbers of monoclonal antibodies to an antigen of choice can be cloned and isolated. The technique produces high affinity monoclonal antibodies for use in passive immunoprophylaxis.

The above described antibodies and antigen binding fragments thereof may be supplied in kit form alone, or as a pharmaceutical composition for in vivo use. The antibodies may be used for therapeutic uses, diagnostic use in immunoassays or as an immunoaffinity agent to purify ORF 2 proteins as described herein.

EXAMPLES

EXAMPLE 1

Baculovirus Cloning of Swine HEV ORF2 Gene

A PCR DNA fragment containing a full-length copy of sHEV ORF2 cDNA was digested with the restriction endonucleases *Bam* HI and *Xho* 1. The digestion products were purified on a QIA quick column and ligated into the respective sites of the bacterial TA-cloning vector pCR2. 1. The ligation products were used to transform competent E. coli DH5α cells, and bacterial clones containing plasmids with the sHEV ORF2 gene insert were selected by DNA gel analysis of miniprep plasmid DNA. Plasmid DNA of bacterial clone pCRsHEV-9 was digested with *Bam* HI and *Xho* I. A 1992 bp DNA fragment was isolated from the restricted DNA and ligated into the bacmid transfer vector pFASTBAC-1 at the *Bam* HI and *Xho* I sites located downstream of the baculovirus polyhedrin promoter. The ligation products were used to transform competent *E. coli* DH5α cells, and bacterial clones containing plasmids with the sHEV ORF2 gene were selected by DNA gel analysis of miniprep plasmid DNA. Digestion of plasmid DNA from the bacterial clone designated pFBsHEV ORF2 (6,681 bp) with *Bam* HI and *Xho* I released a 1992 bp DNA fragment as expected for the sHEV ORF2 DNA insert.

pFBsHEV ORF2 DNA was transformed into competent *E. coli* DHIOBac cells containing parental bacmid DNA to facilitate site-specific recombination of the sHEV ORF2 gene into the baculovirus genome within the *polh* locus. Recombinant bacmid DNA was isolated from amplified bacterial cultures derived from white antibiotic resistant colonies. Bacmid DNA containing sHEV ORF2 DNA was transfected into Sf-9 cells using the cationic lipid CELLFECTIN. Transfected cells were harvested after three days and assayed for expression of sHEV ORF2 capsid proteins by SDS-PAGE and Western blot analysis using antisera to human HEV. A single protein band with a molecular weight of 55,000 daltons was detected in the transfected cells by immunoblotting with the anti-HEV sera. Recombinant baculoviruses in culture media from transfected cells harvested at 72 hours post-transfection was used to infect Sf-9 insect cells in agarose plaque assays. Virus from plaques was isolated and amplified further in Sf-9 insect cells. The resulting recombinant baculovirus expressed sHEV ORF2 proteins in Sf-9 insect cells.

EXAMPLE 2

Establishment of Master Virus Seed Bank.

A virus stock designated bsHEV ORF2 (R257) was prepared in Sf-9 cells following three serial plaque purifications. No wild type baculovirus was present in the virus stock as demonstrated by the absence of wild-type plaque morphology and β-galactosidase expression in agarose plaque assays. Baculovirus genomic DNA was isolated from recombinant virus in the virus stock and subjected to nucleotide sequence analysis using the cycle sequencing technique. The location of the swine HEV ORF2 DNA insert (1992 bp) was confirmed to be in-frame and downstream of the polyhedrin promoter in the *polh* locus as expected. The observed nucleotide sequence shared 100% homology with the nucleotide sequence of the swine HEV ORF2 shown in Figure 1. This bsHEV ORF2 baculovirus stock was tested for microbial sterility, mycoplasma and spiroplasma contamination, and the presence of endotoxins. No microbial contaminants were detected by these tests, and an endotoxin level of 0. 1 EU/ml was observed. bsHEV ORF2 (R257) was designated as the master virus seed bank and stored in 10 ml aliquots at 2°C, – 8°C, and –70°C.

The virus titer of R257 was 2.9 x 10^7 pfu/ml as determined by agarose plaque assay using Sf-9 cells.

EXAMPLE 3

Expression of Recombinant Swine HEV ORF2 Proteins in Insect Cells

Temporal expression of the swine HEV ORF2 gene in baculovirus-infected cells was investigated. Sf-9 insect cells cultivated as shaker suspension cultures in serum-free medium were infected with recombinant baculoviruses encoding the full-length swine hepatitis E virus ORF2 gene. Cell lysates and media were harvested from virus infections daily for four consecutive days and analyzed by SDS-PAGE and immunoblotting methods.

The results showed that in addition to the full-length ORF2 product of 71 kD, multiple sHEV related proteins appeared in infected cells and in the media. The most abundant of these proteins had a molecular weight of 55 kD. The HEV 71 kD protein was detected as early as one day post-infection in infected cell lysates and media and accumulated for several more days in cells disappeared in media by four days post-infection. Another sHEV protein (~ 63 kD) appeared in infected cells and media by one day post-infection and accumulated over the next two days. At four days post-infection, the level of 63 kD protein in cells and media decreased. A shEV 55 kD protein appeared in cells and in media by two days post-infection. The sHEV 55 kD protein accumulated intracellularly at days three and four post-infection. Additionally, sHEV proteins with other molecular weights, but in smaller amounts, were observed intracellularly and extracellularly.

EXAMPLE 4

Recombinant sHEV ORF2 protein purification.

Recombinant sHEV ORF2 proteins were purified from Sf-9 insect cell cultures infected with recombinant baculoviruses expressing the full-length sHEV ORF2 gene using a purification scheme that included anion exchange and size exclusion chromatography. Recombinant swine HEV ORF2 proteins were purified from clarified baculovirus-infected cell lysates. Cell lysates were prepared at 4°C for

30 minutes by differential lysis of infected cells harvested at five days post-infection with the nonionic detergent, Nonidet P-40, at a final concentration of 0.5%. Following cell lysis and removal of infected cell nuclei by centrifugation, cell lysates were diluted 1:10 with Q loading buffer (50 mM Tris-HCl, pH 8.0, 10 mM NaCl) to reduce the ionic strength. In contrast, media harvested from virus infections were clarified by centrifugation, concentrated 10 fold by tangential flow ultrafiltration using hollow fiber filters comprised of polysulfone, and subjected to diafiltration against Q loading buffer to reduce the ionic strength.

Recombinant sHEV ORF2 proteins in cell lysates and media were captured by anion exchange chromatography. Diluted crude lysate (1.5 bed vol.) was loaded onto a Q Sepharose Fast Flow strong anion exchange column (XK50 column, 5.0 x 7.5 cm, 150 ml; Pharmacia, Piscataway, NJ) at a flow rate of 10.0 ml/min. The column was washed first with 1.0 bed volume of loading buffer at a flow rate of 10 ml/min. followed by a second wash with 1.0 bed volume of loading buffer at a flow rate of 20 ml/min. Proteins were eluted with 7.5 bed volumes of a continuous linear NaCl gradient (10 - 300 mM) in loading buffer at a flow rate of 20 ml/min. Recombinant sHEV ORF2 proteins bound to Q Sepharose Fast Flow resin, a strong anion exchange chromatographic matrix, and selectively eluted at a NaCl concentration of 140 mM as determined by SDS-PAGE and immunoblot analyses of unbound and bound column fractions. Fractions containing sHEV ORF2 55 kD proteins were pooled and desalted by gel filtration through a Sephacryl G-25 column (Pharmacia) with Q loading buffer.

The peak protein fraction from the Sephacryl G-25 column was collected and loaded onto a Source 15 Q High Performance (Pharmacia) strong anion exchange column to resolve and concentrate sHEV ORF2 polypeptides. The Source 15 Q HP column was washed and eluted as described above for anion exchange chromatography using Q Sepharose. Recombinant sHEV ORF2 55 kD proteins bound to the matrix and eluted again at 140 mM NaCl. Peak fractions containing sHEV ORF2 proteins were pooled and fractionated further by size exclusion chromatography using a Superdex G-75 column. Size exclusion chromatography using phosphate-buffered saline (pH 7.2) as a final purification step resolved the recombinant sHEV ORF2 55 kD protein from other protein contaminants as

determined by SDS-PAGE and Western blot analyses. The purity of the final bulk product by size exclusion chromatography was > 98% as determined by laser scanning densitometry of Coomassie Blue stained gels.

EXAMPLE 5

Amino terminal sequence analysis of sHEV 55kD protein.

The amino terminus of the recombinant sHEV ORF2 55 kD protein was determined by automated micro Edman degradation. 11 cycles of direct Edman degradation were performed on the recombinant sHEV ORF2 55 kD proteins. The amino acid sequence corresponded to residues 112 through 122 (AVSPAPDTAPV) of the full-length recombinant sHEV ORF2 gene product. The carboxy terminus of the recombinant sHEV ORF2 55 kD protein was determined by automated chemical cleavage. Three rounds of chemical lysis were performed on recombinant sHEV ORF2 55 kD protein. The amino acid sequence corresponded to residues 600 through 602 (VLA) of the full-length recombinant sHEV ORF2 gene product.

The recombinant swine and human HEV ORF2 proteins produced in baculovirus-infected insect cells share 91.4% protein sequence homology. Both swine and human HEV ORF2 gene products undergo proteolytic cleavage to produce final intracellular products of 55 and 56 kD respectively. The amino termini of these two proteins are similar, as N-terminal cleavages occur between amino acids 111 and 112 of both proteins to produce the final protein products. The C-termini of these proteins differ slightly following C-terminal proteolysis, as the swine HEV ORF2 protein ends at amino acid 602 whereas the human HEV ORF2 protein terminates at amino acid 607.

EXAMPLE 6

Detection by EIA of anti-HEV Antibodies In Sera From Swine

To determine if the insect cell-derived swine HEV ORF2 antigen 112-602 could detect anti-HEV antibody in sera from swine and humans, EIAs were carried out as follows on sera collected from swine and humans using either the 55 kilodalton swine ORF2 protein (amino acids 112-602) or the 56 kilodalton protein of the SAR55 strain of HEV (amino acids 112-607).

Capture Plate Preparation

The antigen preparation was diluted to approximate by 0.5 μg/ml in carbonate buffer (Carbonate-Bicarbonate capsules, Sigma #C-3041, final 0.05M, pH9.6) and 100μl of the diluted antigen preparation was added to each of 96 wells of a microtiter plate (Linbro/Titertek, ICN#76-381-04). The plates were then incubated for 18 hours at room temperature, washed twice with 0.02% Tween-20 (KPL #50-63-00) solution, and 120μl of blocking solution was then added and incubated 1 hour at 37°C, followed by washing five times with 0.02% Tween-20 (K&P #50-63-00) solution.

The plates were now ready for use.

Sample Preparation

In a separate microtiter plate, 10-fold dilutions (10^1 10^2, 10^3, 10^4, 10^5, 10^6) of the starting sample were made in blocking buffer.

100μl of dilutions to be tested, starting with the 10^2 dilution, were added into wells of the capture plate. The plate was incubated at 37°C for 30 minutes and then washed five times with 0.02% Tween-20 solution.

100μl of secondary antibody (anti-human-IgG-HRPO, KPL# 74-1006 prepared to manufacturer's recommendations using the blocking reagent as diluent) was added to each well, incubated 30 minutes at 37°C, and then washed five times with 0.02% Tween-20 solution.

100μl of ABTS substrate (ABTS-citric acid-H_2O_2, KPL # 50-66-01) was t added to each well, then kept covered for 30 minutes. After 30 minutes had elapsed, 100μl of stop solution (KPL# 50-85-02) were added to each well and optical density was read at 405nm.

Four five-fold dilutions of a WHO anti-HEV standard preparation (95/584, calibrated to 100 Units/ml) obtained from the National Institute for Biological Standards and Control, Hertfordshire, England, starting at 1:400 (0.25 WHO units), was included in each test plate to establish a sensitivity range and develop a standard line from which relative quantity values were extrapolated.

Commercial reagents

Washing solution, ready-to-use ABTS, HRPO labeled antibodies and BSA were obtained from Kirkegaard & Perry, 2 Cesna Ct, Gaithersburg, MD 20879. Other reagents are available from Sigma.

EIA Results

The results for the swine sera are shown in Figures 2A-2N and for the human sera in Figures 3A-3Q and the data are summarized in Figures 2O and 3R respectively.

EXAMPLE 7

Use of the Swine 55 Kilodalton ORF2 Protein as a Vaccine

As described above in Example 6, the swine ORF-2 protein is immunoreactive as it has been shown to react with a variety of sera taken from swine and humans infected with HEV. This provides support for the use of this recombinant protein as a vaccine to protect against HEV strains. Mammals, preferably rhesus monkeys or chimpanzees, are immunized by intramuscular injection with purified or partially purified recombinant swine ORF-2 protein (112-602) in an amount sufficient (0.1 to 100μg) to stimulate the production of protective antibodies. The immunized mammals are then challenged with a wild-type strain of HEV and protection from challenge may be measured by a variety of assays including, but not limited to, assaying sera of immunized mammals for levels of alanine aminotransferase, (ALT), anti-HEV antibodies or HEV RNA by RT-PCR.

EXAMPLE 8

Hepatitis E Virus (HEV) Capsid Antigen Derived From Virus of Human or Swine is Equally Efficient for Detecting Anti-HEV by Enzyme Immunoassay

The goal of this study was to evaluate and compare a pair of enzyme immunoassays for the detection of antibodies to HEV in human and swine sera. Though we tested only swine and human sera, these results likely apply to other species since it is reported that the ORF2 epitopes are broadly reactive across

species and strains (Anderson, D. A. et al., (1999) J Virol Methods 81:131-42; Khudyakov, Y. E. et al., (1999) J Clin Microbiol 372863-71; Meng, J. et al., (2001) Virology 288:203-11). The assays we describe here are virtually the same but for the capture antigen each employs, namely a truncated portion of the ORF2 gene product from a swine strain of HEV and from a human strain of HEV. The human strain is the Pakistani Sar-55 strain (Bryan, J.P. et al., (1994) J Infect Dis 170:517-21, and the swine strain is the US Meng strain (Meng, X. J. et al., (1997) J Clin Microbiol 40:117-22).

Serum samples

Serial weekly serum samples from two chimpanzees and two rhesus monkeys experimentally infected with HEV were compared with both assays. The chimpanzees were infected with the Pakistani strain (Sar-55) representing genotype 1 and the rhesus monkeys were infected with the Mexican strain of HEV, representing genotype 2.

Another sample set consisted of 792 pig sera (360 samples from US, 152 from Canada, 30 from China, 190 from Korea and 60 from Thailand) and 882 human sera (230 samples from US volunteer blood donors, 603 US pig handlers, 18 Thai animal handlers and 31 blood bank volunteers from China) (Meng, S. J. et al., (1999) J Med Virol 59:297-302). Overall, specimens were obtained in areas where HEV genotypes 1, 3 and possibly 4 predominate (Schlauder, G. G. et al., (2001) J Med Virol 65:282-92). All samples were unlinked from the identity of their donors.

Antigen preparation and purification

The putative HEV capsid protein (ORF2) was expressed in insect cells (SF9) from a recombinant baculovirus (Robinson, R. A. et al., (1998) Protein Expr Purif 12:75084; Tsarev, S. A. et al., (1993) J Infect Dis 168:369-78). The 72kD full-length product was processed in the cells to yield a 63-kD peptide, a 55 or 56-kD peptide, and a 53-kD peptide. The 55 or 56-kD antigen was used in the EIA and was purified by anion-exchange and gel filtration chromatography (Robinson, R. A. et al., (1998) Protein Expr Purif 12:75-84). The products of the human and swine strains contained amino acids 112 to 607 (496 amino acids) and 112 to 602 (491 amino acids), respectively.

EIA for the detection of anti-HEV IgG in swine and humans.

We used a modification of the EIA described by Tsarev (Tsarev, S. A., (1993) J Infect Dis 168:369-78). Polystyrene microwell plates (ICN 76-381-04, Costa Mesa, CA) were incubated with ORF2 antigen diluted in a carbonate-bicarbonate (pH 9.6) buffer for 18 hours at room temperature. The antigen concentration was 0.05 µg/well for the human strain and 0.029 µg/well for the swine strain. The optimal concentrations of capture antigen were established by block titration using a known anti-HEV positive chimpanzee serum and a hyperimmune swine anti-HEV positive serum. The wells were washed twice in an automated plate washer with a commercially available wash solution (Kirkegaard & Perry, Gaithersburg, MD) containing 0.02% Tween 20 in 0.002M imidazole-buffered saline. The wells were blocked with BSA/gelatin for 1 hour at 37°C prior to freezing at –20°C in plastic bags. Immediately before use the blocking buffer was removed and the plates were washed twice with wash buffer as described above.

Ten microliters of each test and control sample were diluted 1:10. The sample was further diluted 1:10 into the antigen-coated test plate (1:100 final test dilution) and incubated for 30 minutes at 37°C. Wells were washed 5 times and 100 µl of horseradish peroxidase (HRPO)-labeled anti-IgG (Kirkegaard & Perry, Gaithersburg, MD) was added to each well. The HRPO-labeled secondary antibodies were species-specific anti-IgG (heavy and light chain) and were used at a net 1.0 µg/ml. Following a 30 minute incubation at 37°C, unbound conjugate was removed by washing 5 times as described above. Azino-diethylbenzotyazol-sulfonate (ABTS) substrate was added for color development and absorbance (405nm) was read after 30 minutes.

The cutoff for the EIA using swine antigen was established for each test from internal controls and throughout this study ranged between 0.300 and 0.383 with a median of 0.330 (Meng, X. J. et al., (1997) Proc Natl Acad Sci USA 94:9860-5). The positive cut-off for the EIA using the human Sar-55 antigen was similarly established (Tsarev, S. A., (1993) J Infect Dis 168:369-78) and ranged between 0.300 and 0.342 in this study. Previously tested negative blood bank samples, dilution buffer and pre-inoculation swine sera served as negative controls.

Statistical Analysis.

Calculations to determine concordance and prevalence were carried out using the PC version of S-Plus software as an add-on to Microsoft Excel.

Results

Development of anti-HEV in non-human primates following infection, as measured by both assays.

Serial samples from two chimpanzees experimentally infected with the Sar-55 (genotype 1) HEV strain (Figure 4) and two rhesus monkeys experimentally infected with the Mexican (genotype 2) HEV strain (Figure 5) were tested with both EIAs. Very similar values were obtained regardless of whether the capture antigen in the EIA was from Sar-55 (genotype 1) or Meng (genotype 3) strain. The agreement for these two sets of data was 98% (Kappa value =0.952, $CI_{95\%}$ 79-106%). In all four cases, seroconversion was detected at the appropriate time and the patterns of antibody positivity were as expected for a normal infection thus validating each assay.

Seroprevalence of HEV in human serum or plasma samples as determined by both assays.

Human sera from HEV endemic and non-endemic areas were tested with both EIAs. The overall prevalence of anti-HEV in the human sera was virtually the same regardless of the capture antigen. Prevalence was 13% when evaluated with the human capture antigen versus 12% with the swine capture antigen (Table 1). Furthermore, the prevalence values for each of the sub-groups were practically equal.

Table 1. Anti-HEV prevalence in human sera as determined by human or swine antigen capture EIAs.

Source	No. (%) positive for antibody reactive with indicated antigen	
	Sar-55 (Human strain)	Meng (Swine strain)
Foreign Pig Handlers	12 (67)	12 (67)
US Pig Handlers	63 (10)	58 (10)
Foreign Blood Donors	5 (16)	5 (16)
US Blood Bank Volunteers	31 (13)	35 (15)
Total	**111 (13)**	**110 (12)**

There was a 99% concordance (Kappa value =0.938, $CI_{95\%}$ 97-99) when data from human sera tested with the human and swine ORF2-coated capture plates were compared (Table 2).

Table 2. Contingency table comparing results of testing human serum with the Sar-55 ORF2 and the Meng ORF2 capture antigens.

		Sar-55 ORF2		
		Negative	Positive	Total
Meng ORF2	Negative	765	7	772
	Positive	6	104	110
	Total	771	111	882

Concordance = 99%, calculated by dividing the sum of concordant values by the sum total. Kappa value = 0.938, $CI_{95\%}$ = 97% – 99%

Comparisons between data obtained from the two EIAs for foreign pig handlers and blood donors each showed 100% agreement and comparisons of results for US volunteer blood donors and pig handlers yielded concordance values of 97% (Kappa value =0.894, $CI_{95\%}$ 95-99%) and 99% (Kappa value =0.936, $CI_{95\%}$ 98-100%) respectively. Therefore, both antigens reacted equally with anti-HEV in human sera.

Seroprevalence of HEV in swine as determined by both assays.

Anti-HEV prevalence in swine sera was also measured by EIAs containing each of the capture antigens. Once again, the results with the two capture antigens agreed. The human and swine ORF2 EIAs yielded 37% and 35% prevalence respectively (Table 3).

Table 3. Anti-HEV prevalence (%) in swine sera as determined by human or swine antigen capture EIAs.

Source	No. (%) positive for antibody reactive with indicated antigen	
	Sar-55 (Human strain)	Meng (Swine strain)
USA	66 (18)	69 (19)
Canada	95 (63)	86 (57)
China	5 (17)	3 (10)
Korea	97 (51)	89 (47)
Thailand	29 (48)	34 (57)
Total	**292 (37)**	**281 (35)**

As seen in Table 4, comparison of test results for swine sera yielded a concordance value of 93% (Kappa value =0.839, $CI_{95\%}$ 86-92%). Independently, the subgroups that made up the swine serum set yielded concordance values of 96% (Kappa value =0.882, $CI_{95\%}$ 93-98%) for the USA, 86% (Kappa value =0.714, $CI_{95\%}$ 60-81%) for Canada, 91% (Kappa value =0.811, $CI_{95\%}$ 76-90%) for Korea, 92% (Kappa value =0.8[illegible], $CI_{95\%}$ 71-97%) for Thailand and 93% (Kappa value =0.714, $CI_{95\%}$ 83-102%) for China.

Table 4. Contingency table comparing results of testing swine serum with the Sar-55 ORF2 and the Meng ORF2 capture antigens.

		Sar-55 ORF2		
		Negative	Positive	Total
Meng ORF2	Negative	476	35	511
	Positive	24	257	281
	Total	500	292	792

Concordance = 93%. Kappa value = 0.839, $CI_{95\%}$ = 86% – 92%

These data demonstrate the comparable ability of each of the capture antigens to identify anti-HEV in swine serum.

The contents of all citations, i.e., journal articles, patents and the like, are incorporated herein by reference.

It is understood that the examples and embodiments described herein are for illustrative purposes and that various modifications and changes in light

thereof to persons skilled in the art are included within the spirit and purview of this application and scope of the appended claims.

Claims

1. A swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112 to 602.

2. A swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112 to 602 of SEQ ID NO: 1.

3. A pharmaceutical composition comprising the protein of claim 1 and a suitable excipient, diluent or carrier.

4. A pharmaceutical composition comprising the protein of claim 2 and a suitable excipient, diluent or carrier.

5. A method of preventing hepatitis E, comprising administering the pharmaceutical composition of claim 3 to a mammal in an amount sufficient to stimulate the production of protective antibodies.

6. A method of preventing hepatitis E, comprising administering the pharmaceutical composition of claim 4 to a mammal in an amount sufficient to stimulate the production of protective antibodies.

7. A vaccine for immunizing a mammal against hepatitis E, said vaccine comprising a protein according to claim 1 in a pharmaceutically acceptable carrier.

8. A vaccine for immunizing a mammal against hepatitis E, said vaccine comprising a protein according to claim 2 in a pharmaceutically acceptable carrier.

9. A kit for preventing hepatitis E in a mammal, said kit comprising a protein according to claim 1.

10. A kit for preventing hepatitis E in a mammal, said kit comprising a protein according to claim 2.

11. A DNA molecule having a sequence consisting of nucleotides which encode amino acids 112 to 602 of a swine hepatitis E virus open reading frame 2 protein.

12. The DNA molecule of claim 11, wherein the molecule encodes amino acids 112 to 602 of SEQ ID NO:1.

13. A recombinant expression vector comprising a DNA molecule according to claims 11 or 12.

14. A host cell containing an expression vector according to claim 13.

15. A method of producing a recombinant hepatitis E virus open reading frame 2 protein, said method comprising:

(a) culturing a host cell of claim 14 under conditions appropriate to cause expression of said protein; and

(b) obtaining said expressed protein from the host cell.

16. A method of detecting antibodies to hepatitis E virus in a biological sample, said method comprising:

(a) contacting said sample with a swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112 to 602; and

(b) detecting immune complexes formed between said protein and said antibodies, wherein detection of said complexes indicates the presence of antibodies to hepatitis E virus in said sample.

17. The method of claim 16, wherein the protein consists of amino acids 112-602 of SEQ ID NO:1.

18. A kit for use in a method of detecting antibodies to hepatitis E virus in a biological sample, said kit comprising a swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112 to 602.

19. The kit of claim 18, wherein the protein consists of amino acids 112-602 of SEQ ID NO:1.

20. Antibodies having specific binding affinity for a swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112 to 602.

21. The antibodies of claim 16, wherein said antibodies have specific binding affinity for a protein consisting of amino acids 112-602 of SEQ ID NO:1.

22. A method for detecting hepatitis E virus in a biological sample, said method comprising;

(a) contacting said sample with the antibodies of claim 20 to form an immune complex with said hepatitis E virus; and

(b) detecting the presence of said complex, wherein detection of said complex indicates the presence of hepatitis E virus in said sample.

23. A method for detecting hepatitis E virus in a biological sample, said method comprising;

(a) contacting said sample with the antibodies of claim 21 to form an immune complex with said hepatitis E virus; and

(b) detecting the presence of said complex, wherein detection of said complex indicates the presence of hepatitis E virus in said sample.

24. A method for producing the antibodies of claim 20, said method comprising immunizing a mammal with a swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112 to 602.

25. A method for producing the antibodies of claim 21, said method comprising immunizing a mammal with a protein consisting of amino acids 112-602 of SEQ ID NO:1.

26. A DNA molecule having a sequence consisting of nucleotides which encode amino acids 112-660 of a swine hepatitis E virus open reading frame 2 protein.

27. The DNA molecule of claim 26, wherein the molecule encodes amino acids 112-660 of SEQ ID. NO. 1.

28. A recombinant expression vector comprising a DNA molecule according to claims 26 and 27.

29. A host cell containing an expression vector according to claim 28.

30. A method of producing a recombinant hepatitis E virus open reading frame 2 protein, said method comprising:

(a) culturing a host cell according to claim 29 under conditions appropriate to cause expression of said protein; and

(b) obtaining said expressed protein form the host cell.

31. A kit for use in a method of detecting antibodies to hepatitis E virus in a biological sample, said kit comprising a swine hepatitis E virus open-reading frame 2 protein consisting of amino acids 112-660.

32. The kit of claim 32, where the protein consists of amino acids 112-660 of SEQ ID NO:1.

FIG. 1A (Seq. ID NO:1)

```
Met Arg Pro Arg Ala Val Leu Leu Leu Leu Phe Val Leu Leu Pro Met
 1               5                  10                  15
Leu Pro Ala Pro Pro Ala Gly Gln Pro Ser Gly Arg Arg Cys Gly Arg
            20                  25                  30
Arg Asn Gly Gly Ala Gly Gly Gly Phe Trp Gly Asp Arg Val Asp Ser
        35                  40                  45
Gln Pro Phe Ala Leu Pro Tyr Ile His Pro Thr Asn Pro Phe Ala Ala
    50                  55                  60
Asp Val Val Ser Gln Pro Gly Ala Gly Val Arg Pro Arg Gln Pro Pro
65                  70                  75                  80
Arg Pro Leu Gly Ser Ala Trp Arg Asp Gln Ser Gln Arg Pro Ser Thr
                85                  90                  95
Ala Pro Arg Arg Arg Ser Ala Pro Ala Gly Ala Ala Pro Leu Thr Ala
            100                 105                 110
Val Ser Pro Ala Pro Asp Thr Ala Pro Val Pro Asp Val Asp Ser Arg
        115                 120                 125
Gly Ala Ile Leu Arg Arg Gln Tyr Asn Leu Ser Thr Ser Pro Leu Thr
    130                 135                 140
Ser Ser Val Ala Ala Gly Thr Asn Leu Val Leu Tyr Ala Ala Pro Leu
145                 150                 155                 160
Asn Pro Leu Leu Pro Leu Gln Asp Gly Thr Asn Thr His Ile Met Ala
                165                 170                 175
Thr Glu Ala Ser Asn Tyr Ala Gln Tyr Arg Val Val Arg Ala Thr Ile
            180                 185                 190
Arg Tyr Arg Pro Leu Val Pro Asn Ala Val Gly Gly Tyr Ala Ile Ser
        195                 200                 205
Ile Ser Phe Trp Pro Gln Thr Thr Thr Thr Pro Thr Ser Val Asp Met
    210                 215                 220
Asn Ser Ile Thr Ser Thr Asp Val Arg Ile Leu Val Gln Pro Gly Ile
225                 230                 235                 240
Ala Ser Glu Leu Val Ile Pro Ser Glu Arg Leu His Tyr Arg Asn Gln
                245                 250                 255
Gly Trp Arg Ser Val Glu Thr Thr Gly Val Ala Glu Glu Glu Ala Thr
            260                 265                 270
Ser Gly Leu Val Met Leu Cys Ile His Gly Ser Pro Val Asn Ser Tyr
        275                 280                 285
Thr Asn Thr Pro Tyr Thr Gly Ala Leu Gly Leu Leu Asp Phe Ala Leu
    290                 295                 300
Glu Leu Glu Phe Arg Asn Leu Thr Pro Gly Asn Thr Asn Thr Arg Val
305                 310                 315                 320
Ser Arg Tyr Thr Ser Thr Ala Arg His Arg Leu Arg Arg Gly Ala Asp
                325                 330                 335
Gly Thr Ala Glu Leu Thr Thr Thr Ala Ala Thr Arg Phe Met Lys Asp
            340                 345                 350
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FIG. 1A (Seq. ID NO:1)

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Leu His Phe Thr Gly Thr Asn Gly Val Gly Glu Val Gly Arg Gly Ile
        355                 360                 365
Ala Leu Thr Leu Phe Asn Leu Ala Asp Thr Leu Leu Gly Gly Leu Pro
    370                 375                 380
Thr Glu Leu Ile Ser Ser Ala Gly Gly Gln Leu Phe Tyr Ser Arg Pro
385                 390                 395                 400
Val Val Ser Ala Asn Gly Glu Pro Thr Val Lys Leu Tyr Thr Ser Val
                405                 410                 415
Glu Asn Ala Gln Gln Asp Lys Gly Ile Thr Ile Pro His Asp Ile Asp
            420                 425                 430
Leu Gly Asp Ser Arg Val Val Ile Gln Asp Tyr Asp Asn Gln His Glu
        435                 440                 445
Gln Asp Arg Pro Thr Pro Ser Pro Ala Pro Ser Arg Pro Phe Ser Val
    450                 455                 460
Leu Arg Ala Asn Asp Val Leu Trp Leu Ser Leu Thr Ala Ala Glu Tyr
465                 470                 475                 480
Asp Gln Thr Thr Tyr Gly Ser Ser Thr Asn Pro Met Tyr Val Ser Asp
                485                 490                 495
Thr Val Thr Leu Val Asn Val Ala Thr Gly Ala Gln Ala Val Ala Arg
            500                 505                 510
Ser Leu Asp Trp Ser Lys Val Thr Leu Asp Gly Arg Pro Leu Thr Thr
        515                 520                 525
Ile Gln Gln Tyr Ser Lys Thr Phe Tyr Val Leu Pro Leu Arg Gly Lys
    530                 535                 540
Leu Ser Phe Trp Glu Ala Gly Thr Thr Lys Ala Gly Tyr Pro Tyr Asn
545                 550                 555                 560
Tyr Asn Thr Thr Ala Ser Asp Gln Ile Leu Ile Glu Asn Ala Ala Gly
                565                 570                 575
His Arg Val Ala Ile Ser Thr Tyr Thr Thr Ser Leu Gly Ala Gly Pro
            580                 585                 590
Thr Ser Ile Ser Ala Val Gly Val Leu Ala Pro His Ser Ala Leu Ala
        595                 600                 605
Val Leu Glu Asp Thr Val Asp Tyr Pro Ala Arg Ala His Thr Phe Asp
    610                 615                 620
Asp Phe Cys Pro Glu Cys Arg Thr Leu Gly Leu Gln Gly Cys Ala Phe
625                 630                 635                 640
Gln Ser Thr Ile Ala Glu Leu Gln Arg Leu Lys Met Lys Val Gly Lys
                645                 650                 655
Thr Arg Glu Ser
            660
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FIG. 1B (Seq. ID NO:2)

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ATGCGCCCTA GGGCTGTTCT GTTGTTGCTC TTCGTGCTTC TGCCTATGCT          50
GCCCGCGCCA CCGGCCGGCC AGCCGTCTGG CCGCCGTTGT GGGCGGCGCA         100
ACGGCGGTGC CGGCGGTGGT TTCTGGGGTG ACAGGGTTGA TTCTCAGCCC         150
TTCGCCCTCC CCTATATTCA TCCAACCAAC CCCTTCGCTG CCGATGTCGT         200
TTCACAACCC GGGGCTGGAG TTCGCCCTCG ACAGCCGCCC CGCCCCCTTG         250
GCTCCGCTTG GCGTGACCAG TCCCAGCGCC CCTCCACTGC CCCCCGTCGT         300
CGATCTGCCC CAGCTGGGGC TGCGCCGCTG ACTGCTGTAT CACCGGCCCC         350
CGACACAGCT CCTGTACCTG ATGTTGACTC ACGTGGTGCT ATCCTGCGCC         400
GGCAGTACAA TCTGTCTACG TCCCCGCTCA CGTCATCTGT CGCTGCTGGT         450
ACCAACCTGG TTCTCTATGC CGCCCCGCTG AATCCTCTCT TGCCCCTCCA         500
GGATGGCACC AACACTCATA TTATGGCTAC TGAGGCGTCC AATTATGCTC         550
AGTATCGGGT TGTTCGAGCT ACGATCCGTT ATCGCCCGCT GGTGCCAAAT         600
GCTGTTGGTG GCTATGCTAT CTCTATTTCT TTCTGGCCTC AAACTACAAC         650
CACCCCTACT TCAGTTGACA TGAACTCTAT TACCTCCACT GATGTCAGGA         700
TTTTGGTTCA GCCCGGTATT GCCTCCGAGT TAGTCATCCC TAGTGAGCGC         750
CTTCATTACC GCAATCAAGG CTGGCGCTCT GTAGAGACCA CGGGCGTGGC         800
CGAGGAGGAA GCTACCTCCG GTCTGGTAAT GCTTTGCATT CACGGTTCTC         850
CTGTTAACTC CTATACTAAC ACACCTTACA CTGGTGCATT GGGGCTCCTT         900
GATTTTGCAT TAGAGCTTGA ATTCAGAAAT TTGACACCCG GGAACACTAA         950
CACCCGTGTT TCCCGGTACA CCAGCACCAGC CCGCCATCGG CTGCGCCGCG        1000
GTGCTGATGG GACCGCAGAG CTTACCACCA CAGCAGCCAC ACGTTTCATG        1050
AAGGACTTGC ATTTCACCGG CACGAACGGC GTTGGTGAGG TGGGTCGCGG        1100
TATAGCTCTA ACACTGTTTA ACCTTGCTGA TACGCTTCTT GGTGGTTTAC        1150
CGACAGAATT GATTTCGTCG GCCGGGGGCC AACTGTTTTA CTCCCGCCCT        1200
GTCGTCTCGG CCAATGGCGA GCCGACGGTT AAGTTATATA CATCTGTTGA        1250
GAATGCGCAG CAGGACAAGG GCATTACCAT CCCACACGAT ATAGATCTGG        1300
GTGATTCCCG TGTGGTTATT CAGGATTATG ATAACCAGCA CGAGCAAGAC        1350
CGACCTACTC CGTCACCAGC CCCCTCTCGC CCTTTCTCAG TTCTTCGCGC        1400
CAATGATGTT CTGTGGCTCT CCCTCACCGC CCCTGAGTAC GATCAGACTA        1450
CATATGGGTC GTCCACCAAC CCTATGTATG TCTCCGATAC GGTCACGCTA        1500
GTTAATGTGG CCACTGGTGC TCAGGCTGTT GCCCGCTCTC TTGATTGGTC        1550
TAAAGTCACT CTGGATGGCC GCCCCCTCAC TACCATTCAG CAGTATTCAA        1600
AGACATTCTA TGTTCTCCCG CTCCGCGGGA AGCTGTCCTT TTGGGAGGCT        1650
GGTACCACTA AGGCCGGCTA CCCGTATAAT TATAATACCA CTGCTAGTGA        1700
TCAAATTTTG ATTGAGAACG CGGCTGGCCA CCGTGTTGCT ATCTCTACCT        1750
ATACCACTAG CTTGGGTGCC GGCCCTACCT CGATTTCCGC CGTTGGTGTG        1800
CTAGCCCCAC ACTCGGCTCT CGCCGTCCTT GAGGATACTG TTGATTACCC        1850
TGCTCGTGCT CATACTTTTG ATGATTTCTG CCCGGAGTGC CGCACCCTTG        1900
GTTTGCAGGG TTGTGCATTC CAGTCTACTA TTGCTGAGCT TCAGCGTCTT        1950
AAAATGAAGG TAGGTAAAAC CCGGGAGTCT                              1980
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Figure 2A

Name	SampleDate	OD				Sample/Coff		Result
		humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
15 Sow 1	Iowa	0.054	0.332	0.094	0.383	0.16	0.25	Neg
16 Sow 2	Iowa	0.059	0.332	0.065	0.383	0.18	0.17	Neg
17 Sow 3	Iowa	1.699	0.332	1.966	0.383	5.12	5.13	Both +
18 Sow 4	Iowa	0.073	0.332	0.098	0.383	0.22	0.26	Neg
19 Sow 5	Iowa	1.999	0.332	2.226	0.383	6.02	5.81	Both +
20 Sow 6	Iowa	1.143	0.332	1.694	0.383	3.44	4.42	Both +
21 Sow 7	Iowa	0.064	0.332	0.090	0.383	0.19	0.23	Neg
22 Sow 8	Iowa	1.713	0.332	2.167	0.383	5.16	5.66	Both +
23 Sow 9	Iowa	0.061	0.332	0.076	0.383	0.18	0.20	Neg
24 Sow 10	Iowa	0.138	0.332	0.192	0.383	0.42	0.50	Neg
25 Sow 11	Iowa	0.701	0.332	1.105	0.383	2.11	2.89	Both +
26 Sow 12	Iowa	1.793	0.332	2.149	0.383	5.40	5.61	Both +
27 Sow 13	Iowa	1.812	0.332	2.023	0.383	5.46	5.28	Both +
28 Sow 14	Iowa	1.360	0.332	1.735	0.383	4.10	4.53	Both +
29 Sow 15	Iowa	0.070	0.332	0.101	0.383	0.21	0.26	Neg
30 Sow 16	Iowa	1.775	0.332	1.989	0.383	5.35	5.19	Both +
31 Sow 17	Iowa	0.411	0.332	0.595	0.383	1.24	1.55	Both +
32 Sow 18	Iowa	0.050	0.332	0.075	0.383	0.15	0.20	Neg
33 Sow 19	Iowa	1.164	0.332	1.618	0.383	3.51	4.22	Both +
34 Sow 20	Iowa	0.069	0.332	0.072	0.383	0.21	0.19	Neg
35 Sow 21	Iowa	0.281	0.332	0.447	0.383	0.85	1.17	swORF2 +
36 Sow 22	Iowa	1.212	0.332	1.916	0.383	3.65	5.00	Both +
37 Sow 23	Iowa	1.667	0.332	1.947	0.383	5.02	5.08	Both +
38 Sow 24	Iowa	0.686	0.332	0.907	0.383	2.07	2.37	Both +
39 Sow 25	Iowa	0.564	0.332	0.730	0.383	1.70	1.91	Both +
40 Sow 26	Iowa	0.664	0.332	0.951	0.383	2.00	2.48	Both +
41 Sow 27	Iowa	0.418	0.332	0.589	0.383	1.26	1.54	Both +
42 Sow 28	Iowa	0.449	0.332	0.660	0.383	1.35	1.72	Both +
43 Sow 29	Iowa	0.049	0.332	0.094	0.383	0.15	0.25	Neg
44 Sow 30	Iowa	0.050	0.332	0.164	0.383	0.15	0.43	Neg
45 Sow 31	Iowa	0.057	0.332	0.068	0.383	0.17	0.18	Neg
46 Sow 32	Iowa	0.051	0.332	0.065	0.383	0.15	0.17	Neg
47 Sow 33	Iowa	0.968	0.332	1.154	0.383	2.92	3.01	Both +
48 Sow 34	Iowa	0.740	0.332	1.097	0.383	2.23	2.86	Both +
49 Sow 35	Iowa	1.461	0.332	1.572	0.383	4.40	4.10	Both +
50 Sow 36	Iowa	0.668	0.332	0.863	0.383	2.01	2.25	Both +
51 Sow 37	Iowa	0.066	0.332	0.091	0.383	0.20	0.24	Neg
52 Sow 38	Iowa	1.256	0.332	1.332	0.383	3.78	3.48	Both +
53 Sow 39	Iowa	0.054	0.332	0.081	0.383	0.16	0.21	Neg
54 Sow 40	Iowa	0.072	0.332	0.096	0.383	0.22	0.25	Neg
55 Sow 41	Iowa	0.223	0.332	0.337	0.383	0.67	0.88	Neg
56 Sow 42	Iowa	0.775	0.332	0.972	0.383	2.33	2.54	Both +
57 Sow 43	Iowa	1.119	0.332	1.296	0.383	3.37	3.38	Both +
58 Sow 44	Iowa	0.534	0.332	0.858	0.383	1.61	2.24	Both +
59 Sow 45	Iowa	0.053	0.332	0.084	0.383	0.16	0.22	Neg
60 Sow 46	Iowa	0.941	0.332	1.219	0.383	2.83	3.18	Both +
61 Sow 47	Iowa	0.251	0.332	0.389	0.383	0.76	1.02	swORF2 +
62 Sow 48	Iowa	0.053	0.332	0.056	0.383	0.16	0.15	Neg
63 Sow 49	Iowa	0.765	0.332	1.103	0.383	2.30	2.88	Both +
64 Sow 50	Iowa	0.052	0.332	0.088	0.383	0.16	0.23	Neg
65 Sow 51	Iowa	0.198	0.332	0.225	0.383	0.60	0.59	Neg
66 Sow 52	Iowa	0.938	0.332	1.197	0.383	2.83	3.13	Both +
67 Sow 53	Iowa	0.743	0.332	1.039	0.383	2.24	2.71	Both +
68 Sow 54	Iowa	0.397	0.332	0.472	0.383	1.20	1.23	Both +
69 Sow 55	Iowa	0.370	0.332	0.440	0.383	1.11	1.15	Both +
70 Sow 56	Iowa	0.238	0.332	0.345	0.383	0.72	0.90	Neg

Figure 2B

		OD				Sample/Coff		Result
Name	SampleDate	humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
71 Sow 57	Iowa	0.235	0.332	0.323	0.383	0.71	0.84	Neg
72 Sow 58	Iowa	0.194	0.332	0.333	0.383	0.58	0.87	Neg
73 Sow 59	Iowa	0.050	0.332	0.073	0.383	0.15	0.19	Neg
74 Sow 60	Iowa	0.057	0.332	0.067	0.383	0.17	0.17	Neg
75 Sow 61	Iowa	0.143	0.332	0.076	0.383	0.43	0.20	Neg
76 Sow 62	Iowa	0.058	0.332	0.068	0.383	0.17	0.18	Neg
77 Sow 63	Iowa	0.479	0.332	0.567	0.383	1.44	1.48	Both +
78 Sow 64	Iowa	0.411	0.332	0.463	0.383	1.24	1.21	Both +
79 Sow 65	Iowa	0.386	0.332	0.404	0.383	1.16	1.05	Both +
80 Sow 66	Iowa	0.198	0.332	0.262	0.383	0.60	0.68	Neg
81 Sow 67	Iowa	0.071	0.332	0.084	0.383	0.21	0.22	Neg
82 Sow 68	Iowa	0.419	0.332	0.504	0.383	1.26	1.32	Both +
83 Sow 69	Iowa	0.059	0.332	0.090	0.383	0.18	0.23	Neg
84 Sow 70	Iowa	0.066	0.332	0.119	0.383	0.20	0.31	Neg
85 Sow 71	Iowa	0.139	0.332	0.181	0.383	0.42	0.47	Neg
86 Sow 72	Iowa	0.844	0.332	0.808	0.383	2.54	2.11	Both +
87 Sow 73	Iowa	0.916	0.332	0.871	0.383	2.76	2.27	Both +
88 Sow 74	Iowa	0.384	0.332	0.439	0.383	1.16	1.15	Both +
89 Sow 75	Iowa	0.055	0.332	0.071	0.383	0.17	0.19	Neg
90 Sow 76	Iowa	0.710	0.332	0.696	0.383	2.14	1.82	Both +
91 Sow 77	Iowa	0.129	0.332	0.136	0.383	0.39	0.36	Neg
92 Sow 78	Iowa	0.063	0.332	0.071	0.383	0.19	0.19	Neg
93 Sow 79	Iowa	0.379	0.332	0.516	0.383	1.14	1.35	Both +
94 Sow 80	Iowa	0.070	0.332	0.090	0.383	0.21	0.23	Neg
95 Sow 81	Iowa	0.088	0.338	0.095	0.335	0.26	0.28	Neg
96 Sow 82	Iowa	0.280	0.338	0.556	0.335	0.83	1.66	swORF2 +
97 Sow 83	Iowa	0.223	0.338	0.511	0.335	0.66	1.53	swORF2 +
98 Sow 84	Iowa	0.107	0.338	0.191	0.335	0.32	0.57	Neg
99 Sow 85	Iowa	0.142	0.338	0.235	0.335	0.42	0.70	Neg
100 Sow 86	Iowa	0.105	0.338	0.251	0.335	0.31	0.75	Neg
101 Sow 87	Iowa	0.118	0.338	0.159	0.335	0.35	0.47	Neg
102 Sow 88	Iowa	0.086	0.338	0.156	0.335	0.25	0.47	Neg
103 Sow 89	Iowa	0.060	0.338	0.052	0.335	0.18	0.16	Neg
104 Sow 90	Iowa	0.053	0.338	0.076	0.335	0.16	0.23	Neg
105 Sow 91	Iowa	0.122	0.338	0.074	0.335	0.36	0.22	Neg
106 Sow 92	Iowa	0.079	0.338	0.073	0.335	0.23	0.22	Neg
107 Sow 93	Iowa	0.152	0.338	0.173	0.335	0.45	0.52	Neg
108 Sow 94	Iowa	0.165	0.338	0.226	0.335	0.49	0.67	Neg
109 Sow 95	Iowa	0.147	0.338	0.226	0.335	0.43	0.67	Neg
110 Sow 96	Iowa	0.078	0.338	0.133	0.335	0.23	0.40	Neg
111 Sow 97	Iowa	0.058	0.338	0.115	0.335	0.17	0.34	Neg
112 Sow 98	Iowa	0.161	0.338	0.303	0.335	0.48	0.90	Neg
113 Sow 99	Iowa	0.058	0.338	0.069	0.335	0.17	0.21	Neg
114 Sow 100	Iowa	0.059	0.338	0.086	0.335	0.17	0.26	Neg
115 Sow 101	Iowa	0.066	0.338	0.149	0.335	0.20	0.44	Neg
116 Sow 102	Iowa	0.248	0.338	0.447	0.335	0.73	1.33	swORF2 +
117 Sow 103	Iowa	0.267	0.338	0.383	0.335	0.79	1.14	swORF2 +
118 Sow 104	Iowa	0.250	0.338	0.267	0.335	0.74	0.80	Neg
119 Sow 105	Iowa	0.066	0.338	0.048	0.335	0.20	0.14	Neg
120 Sow 106	Iowa	0.231	0.338	0.303	0.335	0.68	0.90	Neg
121 Sow 107	Iowa	0.087	0.338	0.079	0.335	0.26	0.24	Neg
122 Sow 108	Iowa	0.051	0.338	0.054	0.335	0.15	0.16	Neg
123 Sow 109	Iowa	0.146	0.338	0.275	0.335	0.43	0.82	Neg
124 Sow 110	Iowa	0.058	0.338	0.072	0.335	0.17	0.21	Neg
125 Sow 111	Iowa	0.083	0.338	0.104	0.335	0.25	0.31	Neg
126 Sow 112	Iowa	0.157	0.338	0.282	0.335	0.46	0.84	Neg
127 Sow 113	Iowa	0.118	0.338	0.268	0.335	0.35	0.80	Neg

Figure 2C

Name	SampleDate	OD				Sample/Coff		Result	
		humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2		
128 Sow 114	Iowa	0.093	0.338	0.146	0.335	0.28	0.44	Neg	0
129 Sow 115	Iowa	0.148	0.338	0.123	0.335	0.44	0.37	Neg	0
130 Sow 116	Iowa	0.083	0.338	0.140	0.335	0.25	0.42	Neg	0
131 Sow 117	Iowa	0.182	0.338	0.099	0.335	0.54	0.30	Neg	0
132 Sow 118	Iowa	0.095	0.338	0.120	0.335	0.28	0.36	Neg	0
133 Sow 119	Iowa	0.072	0.338	0.063	0.335	0.21	0.19	Neg	0
134 Sow 120	Iowa	0.060	0.338	0.064	0.335	0.18	0.19	Neg	0
135 Sow 121	Iowa	0.058	0.338	0.082	0.335	0.17	0.24	Neg	0
136 Sow 122	Iowa	0.060	0.338	0.073	0.335	0.18	0.22	Neg	0
137 Sow 123	Iowa	0.091	0.338	0.199	0.335	0.27	0.59	Neg	0
138 Sow 124	Iowa	0.109	0.338	0.169	0.335	0.32	0.50	Neg	0
139 Sow 125	Iowa	0.127	0.338	0.190	0.335	0.38	0.57	Neg	0
140 Sow 126	Iowa	0.083	0.338	0.138	0.335	0.25	0.41	Neg	0
141 Sow 127	Iowa	0.070	0.338	0.063	0.335	0.21	0.19	Neg	0
142 Sow 128	Iowa	0.116	0.338	0.159	0.335	0.34	0.47	Neg	0
143 Sow 129	Iowa	0.055	0.338	0.054	0.335	0.16	0.16	Neg	0
144 Sow 130	Iowa	0.105	0.338	0.092	0.335	0.31	0.27	Neg	0
145 Sow 131	Iowa	0.081	0.338	0.083	0.335	0.24	0.25	Neg	0
146 Sow 132	Iowa	0.139	0.338	0.194	0.335	0.41	0.58	Neg	0
147 Sow 133	Iowa	0.129	0.338	0.179	0.335	0.38	0.53	Neg	0
148 Sow 134	Iowa	0.094	0.338	0.115	0.335	0.28	0.34	Neg	0
149 Sow 135	Iowa	0.076	0.338	0.071	0.335	0.22	0.21	Neg	0
150 Sow 136	Iowa	0.118	0.338	0.195	0.335	0.35	0.58	Neg	0
151 Sow 137	Iowa	0.065	0.338	0.087	0.335	0.19	0.26	Neg	0
152 Sow 138	Iowa	0.065	0.338	0.068	0.335	0.19	0.20	Neg	0
153 Sow 139	Iowa	0.123	0.338	0.139	0.335	0.36	0.41	Neg	0
154 Sow 140	Iowa	0.067	0.338	0.066	0.335	0.20	0.20	Neg	0
155 Sow 141	Iowa	0.067	0.338	0.069	0.335	0.20	0.21	Neg	0
156 Sow 142	Iowa	0.091	0.338	0.134	0.335	0.27	0.40	Neg	0
157 Sow 143	Iowa	0.119	0.338	0.100	0.335	0.35	0.30	Neg	0
158 Sow 144	Iowa	0.077	0.338	0.082	0.335	0.23	0.24	Neg	0
159 Sow 145	Iowa	0.078	0.338	0.094	0.335	0.23	0.28	Neg	0
160 Sow 146	Iowa	0.095	0.338	0.113	0.335	0.28	0.34	Neg	0
161 Sow 147	Iowa	0.069	0.338	0.086	0.335	0.20	0.26	Neg	0
162 Sow 148	Iowa	0.067	0.338	0.083	0.335	0.20	0.25	Neg	0
163 Sow 149	Iowa	0.061	0.338	0.062	0.335	0.18	0.19	Neg	0
164 Sow 150	Iowa	0.066	0.338	0.072	0.335	0.20	0.21	Neg	0
165 Sow 151	Iowa	0.065	0.338	0.082	0.335	0.19	0.24	Neg	0
166 Sow 152	Iowa	0.062	0.338	0.053	0.335	0.18	0.16	Neg	0
167 Sow 153	Iowa	0.090	0.338	0.099	0.335	0.27	0.30	Neg	0
168 Sow 154	Iowa	0.101	0.338	0.102	0.335	0.30	0.30	Neg	0
169 Sow 155	Iowa	0.076	0.338	0.108	0.335	0.22	0.32	Neg	0
170 Sow 156	Iowa	0.072	0.338	0.092	0.335	0.21	0.27	Neg	0
171 Sow 157	Iowa	0.067	0.338	0.076	0.335	0.20	0.23	Neg	0
172 Sow 158	Iowa	0.084	0.338	0.093	0.335	0.25	0.28	Neg	0
173 Sow 159	Iowa	0.055	0.338	0.095	0.335	0.16	0.28	Neg	0
174 Sow 160	Iowa	0.067	0.338	0.060	0.335	0.20	0.18	Neg	0
175 Sow 161	Iowa	0.086	0.338	0.079	0.335	0.25	0.24	Neg	0
176 Sow 162	Iowa	0.176	0.338	0.181	0.335	0.52	0.54	Neg	0
177 Sow 163	Iowa	0.279	0.338	0.280	0.335	0.83	0.84	Neg	0
178 Sow 164	Iowa	0.143	0.338	0.140	0.335	0.42	0.42	Neg	0
179 Sow 165	Iowa	0.085	0.338	0.082	0.335	0.25	0.24	Neg	0
180 Sow 166	Iowa	0.122	0.338	0.145	0.335	0.36	0.43	Neg	0
181 Sow 167	Iowa	0.063	0.338	0.079	0.335	0.19	0.24	Neg	0
182 Sow 168	Iowa	0.062	0.338	0.071	0.335	0.18	0.21	Neg	0
183 Sow 169	Iowa	0.115	0.338	0.140	0.335	0.34	0.42	Neg	0
184 Sow 170	Iowa	0.049	0.338	0.094	0.335	0.14	0.28	Neg	0

Figure 2D

Name	SampleDate	OD humSAR55	Cutoff 1	swORF2	Cutoff 2	Sample/Coff humSAR55	swORF2	Result
185 Sow 171	Iowa	0.074	0.338	0.090	0.335	0.22	0.27	Neg
186 Sow 172	Iowa	0.118	0.338	0.116	0.335	0.35	0.35	Neg
187 Sow 173	Iowa	0.130	0.338	0.090	0.335	0.38	0.27	Neg
188 Sow 174	Iowa	0.088	0.338	0.098	0.335	0.26	0.29	Neg
189 Sow 175	Iowa	0.085	0.338	0.100	0.335	0.25	0.30	Neg
190 Sow 176	Iowa	0.072	0.338	0.100	0.335	0.21	0.30	Neg
191 Sow 177	Iowa	0.149	0.338	0.123	0.335	0.44	0.37	Neg
192 Sow 178	Iowa	0.088	0.338	0.135	0.335	0.26	0.40	Neg
193 Sow 179	Iowa	0.065	0.338	0.060	0.335	0.19	0.18	Neg
194 Sow 180	Iowa	0.057	0.338	0.132	0.335	0.17	0.39	Neg
195 Sow 181	Iowa	0.091	0.338	0.103	0.335	0.27	0.31	Neg
196 Sow 182	Iowa	0.080	0.338	0.080	0.335	0.24	0.24	Neg
197 Sow 183	Iowa	0.102	0.338	0.107	0.335	0.30	0.32	Neg
198 Sow 184	Iowa	0.111	0.338	0.093	0.335	0.33	0.28	Neg
199 Sow 185	Iowa	0.079	0.338	0.080	0.335	0.23	0.24	Neg
200 Sow 186	Iowa	0.146	0.338	0.096	0.335	0.43	0.29	Neg
201 Sow 187	Iowa	0.060	0.338	0.073	0.335	0.18	0.22	Neg
202 Sow 188	Iowa	0.093	0.338	0.094	0.335	0.28	0.28	Neg
203 Sow 189	Iowa	0.079	0.338	0.081	0.335	0.23	0.24	Neg
204 Sow 190	Iowa	0.073	0.338	0.069	0.335	0.22	0.21	Neg
205 Sow 191	Iowa	0.095	0.338	0.085	0.335	0.28	0.25	Neg
206 Sow 192	Iowa	0.095	0.338	0.088	0.335	0.28	0.26	Neg
207 Sow 193	Iowa	0.171	0.338	0.131	0.335	0.51	0.39	Neg
208 Sow 194	Iowa	0.101	0.338	0.166	0.335	0.30	0.50	Neg
209 Sow 195	Iowa	0.089	0.338	0.076	0.335	0.26	0.23	Neg
210 Sow 196	Iowa	0.111	0.338	0.123	0.335	0.33	0.37	Neg
211 Sow 197	Iowa	0.075	0.338	0.078	0.335	0.22	0.23	Neg
212 Sow 198	Iowa	0.067	0.338	0.086	0.335	0.20	0.26	Neg
213 Sow 199	Iowa	0.100	0.338	0.099	0.335	0.30	0.30	Neg
214 Sow 200	Iowa	0.063	0.338	0.063	0.335	0.19	0.19	Neg
215 Sow 201	Iowa	0.073	0.338	0.087	0.335	0.22	0.26	Neg
216 Sow 202	Iowa	0.094	0.338	0.091	0.335	0.28	0.27	Neg
217 Sow 203	Iowa	0.094	0.338	0.110	0.335	0.28	0.33	Neg
218 Sow 204	Iowa	0.069	0.338	0.076	0.335	0.20	0.23	Neg
219 Sow 205	Iowa	0.076	0.338	0.104	0.335	0.22	0.31	Neg
220 Sow 206	Iowa	0.091	0.338	0.103	0.335	0.27	0.31	Neg
221 Sow 207	Iowa	0.083	0.338	0.102	0.335	0.25	0.30	Neg
222 Sow 208	Iowa	0.092	0.338	0.083	0.335	0.27	0.25	Neg
223 CSFP-1	Chin	0.171	0.300	0.089	0.335	0.57	0.30	Neg
224 CSFP-2	Chin	0.158	0.300	0.093	0.335	0.53	0.31	Neg
225 CSFP-3	Chin	0.212	0.300	0.114	0.335	0.71	0.38	Neg
226 CSFP-4	Chin	0.134	0.300	0.086	0.335	0.45	0.29	Neg
227 CSFP-5	Chin	0.211	0.300	0.117	0.335	0.70	0.39	Neg
228 CSFP-6	Chin	0.165	0.300	0.102	0.335	0.55	0.34	Neg
229 CSFP-7	Chin	0.183	0.300	0.120	0.335	0.61	0.40	Neg
230 CSFP-8	Chin	0.128	0.300	0.165	0.335	0.43	0.55	Neg
231 CSFP-9	Chin	0.260	0.300	0.196	0.335	0.87	0.65	Neg
232 CSFP-10	Chin	0.232	0.300	0.168	0.335	0.77	0.56	Neg
233 1	Chin	0.839	0.300	0.725	0.330	2.80	2.42	Both +
234 2	Chin	0.240	0.300	0.172	0.330	0.80	0.57	Neg
235 3	Chin	0.739	0.300	0.507	0.330	2.46	1.69	Both +
236 4	Chin	0.187	0.300	0.150	0.330	0.62	0.50	Neg
237 5	Chin	0.170	0.300	0.097	0.330	0.57	0.32	Neg
238 6	Chin	0.319	0.300	0.228	0.330	1.06	0.76	sar55 +
239 7	Chin	0.261	0.300	0.169	0.330	0.87	0.56	Neg
240 8	Chin	0.254	0.300	0.161	0.330	0.85	0.54	Neg
241 9	Chin	0.151	0.300	0.142	0.330	0.50	0.47	Neg

Figure 2E

Name	SampleDate	OD				Sample/Coff		Result	
		humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2		
242 10	Chin	0.210	0.300	0.151	0.330	0 70	0.50	Neg	0
243 11	Chin	0.154	0.300	0.123	0.330	0 51	0.41	Neg	0
244 12	Chin	0.140	0.300	0.095	0.330	0 47	0.32	Neg	0
245 13	Chin	0.277	0.300	0.202	0.330	0 92	0.67	Neg	0
246 14	Chin	0.217	0.300	0 157	0.330	0.72	0.52	Neg	0
247 15	Chin	0.364	0.300	0.176	0.330	1.21	0.59	sar55 +	1
248 16	Chin	0.232	0.300	0.163	0.330	0.77	0.54	Neg	0
249 17	Chin	0.216	0.300	0.138	0.330	0.72	0.46	Neg	0
250 18	Chin	0.286	0.300	0.219	0.330	0.95	0.73	Neg	0
251 19	Chin	0.476	0.300	0.360	0.330	1.59	1.20	Both +	3
252 20	Chin	0.170	0.300	0.119	0.330	0.57	0.40	Neg	0
253 M1-1	Thai	0.089	0.300	0.080	0.330	0.30	0.27	Neg	0
254 M1-2	Thai	0.065	0.300	0.057	0.330	0.22	0.19	Neg	0
255 M1-3	Thai	0.057	0.300	0.056	0.330	0.19	0.19	Neg	0
256 M1-4	Thai	0.083	0.300	0.079	0.330	0.28	0.26	Neg	0
257 M1-5	Thai	0.074	0.300	0.078	0.330	0.25	0.26	Neg	0
258 M1-6	Thai	0.084	0.300	0.072	0.330	0.28	0.24	Neg	0
259 M1-7	Thai	0.256	0.300	0.23[illegible]	0.330	0.85	0.79	Neg	0
260 M1-8	Thai	0.114	0.300	0.118	0.330	0.38	0.39	Neg	0
261 M1-9	Thai	0.109	0.300	0.109	0.330	0.36	0.36	Neg	0
262 M1-10	Thai	0.073	0.300	0.066	0.330	0.24	0.22	Neg	0
263 M2-1	Thai	0.112	0.300	0.089	0.330	0.37	0.30	Neg	0
264 M2-2	Thai	0.197	0.300	0.223	0.330	0.66	0.74	Neg	0
265 M2-3	Thai	0.182	0.300	0.215	0.330	0.61	0.72	Neg	0
266 M2-4	Thai	0.376	0.300	0.414	0.330	1.25	1.38	Both +	3
267 M2-5	Thai	0.669	0.300	0.859	0.330	2.23	2.86	Both +	3
268 M2-6	Thai	0.277	0.300	0.473	0.330	0.92	1.58	swORF2 +	2
269 M2-7	Thai	0.244	0.300	0.266	0.330	0.81	0.89	Neg	0
270 M2-8	Thai	0.170	0.300	0.181	0.330	0.57	0.60	Neg	0
271 M2-9	Thai	0.267	0.300	0.213	0.330	0.89	0.71	Neg	0
272 M2-10	Thai	0.717	0.300	0.722	0.330	2.39	2.41	Both +	3
273 M3-1	Thai	1.605	0.300	1.762	0.330	5.35	5.87	Both +	3
274 M3-2	Thai	1.430	0.300	1.598	0.330	4.77	5.33	Both +	3
275 M3-3	Thai	0.551	0.300	0.542	0.330	1.84	1.81	Both +	3
276 M3-4	Thai	1.250	0.300	1.660	0.330	4.17	5.53	Both +	3
277 M3-5	Thai	1.039	0.300	1.191	0.330	3.46	3.97	Both +	3
278 M3-6	Thai	0.909	0.300	1.018	0.330	3.03	3.39	Both +	3
279 M3-7	Thai	1.146	0.300	1.793	0.330	3.82	5.98	Both +	3
280 M3-8	Thai	1.445	0.300	1.664	0.330	4.82	5.55	Both +	3
281 M3-9	Thai	1.359	0.300	1.737	0.330	4.53	5.79	Both +	3
282 M3-10	Thai	0.194	0.300	0.274	0.330	0.65	0.91	Neg	0
283 M4-1	Thai	1.379	0.300	1.971	0.330	4.60	6.57	Both +	3
284 M4-2	Thai	1.036	0.300	1.285	0.330	3.45	4.28	Both +	3
285 M4-3	Thai	1.536	0.300	1.643	0.330	5.12	5.48	Both +	3
286 M4-4	Thai	0.537	0.300	0.688	0.330	1.79	2.29	Both +	3
287 M4-5	Thai	0.734	0.300	1.145	0.330	2.45	3.82	Both +	3
288 M4-6	Thai	0.401	0.300	0.483	0.330	1.34	1.61	Both +	3
289 M4-7	Thai	0.536	0.300	0.847	0.330	1.79	2.82	Both +	3
290 M4-8	Thai	0.181	0.300	0.175	0.330	0.60	0.58	Neg	0
291 M4-9	Thai	1.347	0.300	1.519	0.330	4.49	5.06	Both +	3
292 M4-10	Thai	0.283	0.300	0.369	0.330	0.94	1.23	swORF2 +	2
293 M6-1	Thai	0.804	0.300	1.115	0.330	2.68	3.72	Both +	3
294 M6-2	Thai	0.577	0.300	0.756	0.330	1.92	2.52	Both +	3
295 M6-3	Thai	0.772	0.300	1.341	0.330	2.57	4.47	Both +	3
296 M6-4	Thai	0.374	0.300	0.383	0.330	1.25	1.28	Both +	3
297 M6-5	Thai	0.610	0.300	0.755	0.330	2.03	2.52	Both +	3
298 M6-6	Thai	1.118	0.300	1.308	0.330	3.73	4.36	Both +	3

Figure 2F

Name	SampleDate	OD humSAR55	Cutoff 1	swORF2	Cutoff 2	Sample/Coff humSAR55	swORF2	Result
299 M6-7	Thai	0.209	0.300	0.224	0.330	0.70	0.75	Neg
300 M6-8	Thai	0.585	0.300	0.908	0.330	1.95	3.03	Both +
301 M6-9	Thai	0.258	0.300	0.307	0.330	0.86	1.02	swORF2 +
302 M6-10	Thai	0.906	0.300	1.170	0.330	3.02	3.90	Both +
303 A1	Thai	0.195	0.300	0.205	0.330	0.65	0.68	Neg
304 A2	Thai	0.141	0.300	0.149	0.330	0.47	0.50	Neg
305 A3	Thai	0.214	0.300	0.218	0.330	0.71	0.73	Neg
306 A4	Thai	0.266	0.300	0.275	0.330	0.89	0.92	Neg
307 A5	Thai	0.200	0.300	0.179	0.330	0.67	0.60	Neg
308 A6	Thai	0.245	0.300	0.256	0.330	0.82	0.85	Neg
309 A7	Thai	0.180	0.300	0.246	0.330	0.60	0.82	Neg
310 A8	Thai	0.123	0.300	0.351	0.330	0.41	1.17	swORF2 +
311 A9	Thai	0.588	0.300	0.740	0.330	1.96	2.47	Both +
312 A10	Thai	0.266	0.300	0.358	0.330	0.89	1.19	swORF2 +
313 WA3	Cana	1.060	0.300	1.560	0.330	3.53	5.20	Both +
314 WA4	Cana	0.722	0.300	0.894	0.330	2.41	2.98	Both +
315 WA5	Cana	1.009	0.300	1.426	0.330	3.36	4.75	Both +
316 WA6	Cana	1.146	0.300	1.498	0.330	3.82	4.99	Both +
317 WA7	Cana	0.635	0.300	0.872	0.330	2.12	2.91	Both +
318 WA8	Cana	1.644	0.300	2.156	0.330	5.48	7.19	Both +
319 WA9	Cana	1.067	0.300	1.494	0.330	3.56	4.98	Both +
320 WA10	Cana	0.614	0.300	0.783	0.330	2.05	2.61	Both +
321 WA11	Cana	0.873	0.300	1.009	0.330	2.91	3.36	Both +
322 WA12	Cana	0.843	0.300	1.227	0.330	2.81	4.09	Both +
323 WB3	Cana	0.304	0.300	0.370	0.330	1.01	1.23	Both +
324 WB4	Cana	0.841	0.300	1.219	0.330	2.80	4.06	Both +
325 WB5	Cana	0.252	0.300	0.221	0.330	0.84	0.74	Neg
326 WB6	Cana	0.323	0.300	0.422	0.330	1.08	1.41	Both +
327 WB7	Cana	0.205	0.300	0.193	0.330	0.68	0.64	Neg
328 WB8	Cana	0.566	0.300	0.754	0.330	1.89	2.51	Both +
329 WB9	Cana	0.416	0.300	0.544	0.330	1.39	1.81	Both +
330 WB10	Cana	0.392	0.300	0.420	0.330	1.31	1.40	Both +
331 WB11	Cana	0.710	0.300	0.899	0.330	2.37	3.00	Both +
332 WC2	Cana	0.732	0.300	0.954	0.330	2.44	3.18	Both +
333 WC3	Cana	0.570	0.300	0.775	0.330	1.90	2.58	Both +
334 WC4	Cana	0.680	0.300	0.857	0.330	2.27	2.86	Both +
335 WC5	Cana	0.647	0.300	0.803	0.330	2.16	2.68	Both +
336 WC6	Cana	0.904	0.300	1.189	0.330	3.01	3.96	Both +
337 WC7	Cana	0.958	0.300	1.147	0.330	3.19	3.82	Both +
338 WC8	Cana	0.424	0.300	0.436	0.330	1.41	1.45	Both +
339 WC9	Cana	0.418	0.300	0.520	0.330	1.39	1.73	Both +
340 WC10	Cana	0.432	0.300	0.539	0.330	1.44	1.80	Both +
341 WC11	Cana	0.262	0.300	0.283	0.330	0.87	0.94	Neg
342 WC12	Cana	0.462	0.300	0.533	0.330	1.54	1.78	Both +
343 WD3	Cana	1.302	0.300	1.625	0.330	4.34	5.42	Both +
344 WD4	Cana	0.598	0.300	0.743	0.330	1.99	2.48	Both +
345 WD5	Cana	0.488	0.300	0.539	0.330	1.63	1.80	Both +
346 WD6	Cana	0.992	0.300	1.176	0.330	3.31	3.92	Both +
347 WD7	Cana	0.425	0.300	0.521	0.330	1.42	1.74	Both +
348 WD8	Cana	0.343	0.300	0.326	0.330	1.14	1.09	Both +
349 WD9	Cana	0.505	0.300	0.598	0.330	1.68	1.99	Both +
350 WD10	Cana	0.546	0.300	0.573	0.330	1.82	1.91	Both +
351 WD11	Cana	0.618	0.300	0.677	0.330	2.06	2.26	Both +
352 WE3	Cana	0.531	0.300	0.620	0.330	1.77	2.07	Both +
353 WE4	Cana	0.361	0.300	0.281	0.330	1.20	0.94	sar55 +
354 WE5	Cana	0.236	0.300	0.231	0.330	0.79	0.77	Neg
355 WE6	Cana	0.399	0.300	0.468	0.330	1.33	1.56	Both +

Figure 2G

Name	SampleDate	OD				Sample/Coff		Result
		humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
356 WE7	Cana	0.238	0.300	0.260	0.330	0.79	0.87	Neg
357 WE8	Cana	0.166	0.300	0.177	0.330	0.55	0.59	Neg
358 WE9	Cana	0.192	0.300	0.175	0.330	0.64	0.58	Neg
359 WE10	Cana	0.345	0.300	0.356	0.330	1.15	1.19	Both +
360 WE11	Cana	0.267	0.300	0.239	0.330	0.89	0.80	Neg
361 WE12	Cana	0.627	0.300	0.657	0.330	2.09	2.19	Both +
362 WF2	Cana	0.408	0.300	0.458	0.330	1.36	1.53	Both +
363 WF3	Cana	0.276	0.300	0.204	0.330	0.92	0.68	Neg
364 WF4	Cana	0.329	0.300	0.251	0.330	1.10	0.84	sar55 +
365 WF5	Cana	0.211	0.300	0.168	0.330	0.70	0.56	Neg
366 WF6	Cana	0.346	0.300	0.223	0.330	1.15	0.74	sar55 +
367 WF7	Cana	0.332	0.300	0.239	0.330	1.11	0.80	sar55 +
368 WF8	Cana	0.285	0.300	0.274	0.330	0.95	0.91	Neg
369 WF9	Cana	0.252	0.300	0.254	0.330	0.84	0.85	Neg
370 WF10	Cana	0.652	0.300	0.678	0.330	2.17	2.26	Both +
371 WF11	Cana	0.268	0.300	0.208	0.330	0.89	0.69	Neg
372 WF12	Cana	0.300	0.300	0.235	0.330	1.00	0.78	sar55 +
373 WG3	Cana	0.298	0.300	0.201	0.330	0.99	0.67	Neg
374 WG4	Cana	0.298	0.300	0.228	0.330	0.99	0.76	Neg
375 WG5	Cana	0.324	0.300	0.190	0.330	1.08	0.63	sar55 +
376 WG6	Cana	0.555	0.300	0.536	0.330	1.85	1.79	Both +
377 WG7	Cana	0.484	0.300	0.397	0.330	1.61	1.32	Both +
378 WG8	Cana	0.253	0.300	0.145	0.330	0.88	0.48	Neg
379 WG9	Cana	0.303	0.300	0.203	0.330	1.01	0.68	sar55 +
380 WG10	Cana	0.360	0.300	0.220	0.330	1.20	0.73	sar55 +
381 WG11	Cana	0.759	0.300	0.632	0.330	2.53	2.11	Both +
382 WG12	Cana	0.434	0.300	0.287	0.330	[illegible]	0.96	sar55 +
383 WH3	Cana	0.294	0.300	0.499	0.330	0.98	1.66	swORF2 +
384 WH4	Cana	0.409	0.300	0.375	0.330	1.36	1.25	Both +
385 WH6	Cana	0.542	0.300	[illegible]	0.330	1.81	1.35	Both +
386 5-S1	Sask	0.182	0.300	0.258	0.330	0.61	0.86	Neg
387 5-S2	Sask	0.274	0.300	0.161	0.330	0.91	0.54	Neg
388 5-S3	Sask	[illegible]	0.300	0.151	0.330	1.33	0.50	sar55 +
389 5-S4	Sask	0.345	0.300	0.221	0.330	1.15	0.74	sar55 +
390 5-S5	Sask	0.225	0.300	0.138	0.330	0.75	0.46	Neg
391 5-S6	Sask	0.244	0.300	0.129	0.330	0.81	0.43	Neg
392 5-S7	Sask	1.133	0.300	0.770	0.330	3.78	2.57	Both +
393 5-S8	Sask	0.150	0.300	0.103	0.330	0.50	0.34	Neg
394 5-S9	Sask	0.344	0.300	0.288	0.330	1.15	0.96	sar55 +
395 5-S10	Sask	0.234	0.300	0.148	0.330	0.78	0.49	Neg
396 5-S11	Sask	1.261	0.300	0.968	0.330	4.20	3.23	Both +
397 5-S12	Sask	0.449	0.300	0.235	0.330	1.50	0.78	sar55 +
398 5-S13	Sask	0.852	0.300	0.431	0.330	2.84	1.44	Both +
399 5-S14	Sask	0.401	0.300	0.168	0.330	1.34	0.56	sar55 +
400 5-S15	Sask	0.661	0.300	0.396	0.330	2.20	1.32	Both +
401 5-S16	Sask	0.671	0.300	0.535	0.330	2.24	1.78	Both +
402 5-S17	Sask	0.922	0.300	0.644	0.330	3.07	2.15	Both +
403 5-S18	Sask	0.682	0.300	0.413	0.330	2.27	1.38	Both +
404 5-S19	Sask	0.591	0.300	0.335	0.330	1.97	1.12	Both +
405 5-S20	Sask	0.673	0.300	0.512	0.330	2.24	1.71	Both +
406 5-S21	Sask	1.204	0.300	0.825	0.330	4.01	2.75	Both +
407 5-S22	Sask	0.196	0.300	0.194	0.330	0.65	0.65	Neg
408 5-S23	Sask	0.253	0.300	0.237	0.330	0.84	0.79	Neg
409 5-S24	Sask	0.521	0.300	0.920	0.330	1.74	3.07	Both +
410 5-S25	Sask	0.074	0.300	0.089	0.330	0.25	0.30	Neg
411 5-S26	Sask	0.214	0.300	0.210	0.330	0.71	0.70	Neg
412 6-S1	Sask	0.292	0.300	0.328	0.330	0.97	1.09	swORF2 +

Figure 2H

Name	SampleDate	OD				Sample/Coff		Result
		humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
413 6-S2	Sask	0.303	0.300	0.357	0.330	1.01	1.19	Both +
414 6-S3	Sask	0.154	0.300	0.194	0.330	0.51	0.65	Neg
415 6-S4	Sask	0.208	0.300	0.268	0.330	0.69	0.89	Neg
416 6-S5	Sask	0.689	0.300	0.837	0.330	2.30	2.79	Both +
417 6-S6	Sask	0.238	0.300	0.215	0.330	0.79	0.72	Neg
418 6-S7	Sask	0.130	0.300	0.137	0.330	0.43	0.46	Neg
419 6-S8	Sask	0.197	0.300	0.186	0.330	0.66	0.62	Neg
420 6-S9	Sask	0.292	0.300	0.314	0.330	0.97	1.05	swORF2 +
421 6-S10	Sask	0.212	0.300	0.211	0.330	0.71	0.70	Neg
422 6-S11	Sask	0.251	0.300	0.262	0.330	0.84	0.87	Neg
423 6-S12	Sask	0.436	0.300	0.553	0.330	1.45	1.84	Both +
424 6-S13	Sask	0.222	0.300	0.243	0.330	0.74	0.81	Neg
425 6-S14	Sask	0.263	0.300	0.315	0.330	0.88	1.05	swORF2 +
426 6-S15	Sask	0.210	0.300	0.224	0.330	0.70	0.75	Neg
427 7-S1	Sask	0.360	0.300	0.469	0.330	1.20	1.56	Both +
428 7-S2	Sask	0.319	0.300	0.425	0.330	1.06	1.42	Both +
429 7-S3	Sask	0.146	0.300	0.121	0.330	0.49	0.40	Neg
430 7-S4	Sask	0.469	0.300	0.679	0.330	1.56	2.26	Both +
431 7-S5	Sask	0.494	0.300	0.722	0.330	1.65	2.41	Both +
432 7-S6	Sask	0.191	0.300	0.223	0.330	0.64	0.74	Neg
433 7-S7	Sask	0.251	0.300	0.243	0.330	0.84	0.81	Neg
434 7-S8	Sask	0.177	0.300	0.156	0.330	0.59	0.52	Neg
435 7-S9	Sask	0.448	0.300	0.428	0.330	1.49	1.43	Both +
436 7-S10	Sask	0.179	0.300	0.194	0.330	0.60	0.65	Neg
437 7-S11	Sask	0.653	0.300	0.681	0.330	2.18	2.27	Both +
438 7-S12	Sask	0.286	0.300	0.327	0.330	0.95	1.09	swORF2 +
439 7-S13	Sask	0.162	0.300	0.147	0.330	0.54	0.49	Neg
440 7-S14	Sask	0.553	0.300	0.560	0.330	1.84	1.87	Both +
441 7-S15	Sask	0.449	0.300	0.367	0.330	1.50	1.22	Both +
442 7-S16	Sask	0.227	0.300	0.221	0.330	0.76	0.74	Neg
443 7-S17	Sask	0.141	0.300	0.136	0.330	0.47	0.45	Neg
444 7-S18	Sask	0.290	0.300	0.350	0.330	0.97	1.17	swORF2 +
445 7-S19	Sask	0.367	0.300	0.369	0.330	1.22	1.23	Both +
446 7-S20	Sask	0.162	0.300	0.116	0.330	0.54	0.39	Neg
447 7-S21	Sask	0.210	0.300	0.208	0.330	0.70	0.69	Neg
448 9-S1	Sask	0.332	0.300	0.308	0.330	1.11	1.03	Both +
449 9-S2	Sask	0.413	0.300	0.387	0.330	1.38	1.29	Both +
450 9-S3	Sask	0.442	0.300	0.396	0.330	1.47	1.32	Both +
451 9-S4	Sask	0.378	0.300	0.452	0.330	1.26	1.51	Both +
452 9-S5	Sask	0.776	0.300	0.880	0.330	2.59	2.93	Both +
453 9-S6	Sask	0.163	0.300	0.200	0.330	0.54	0.67	Neg
454 9-S7	Sask	0.279	0.300	0.246	0.330	0.93	0.82	Neg
455 9-S8	Sask	0.300	0.300	0.325	0.330	1.00	1.08	Both +
456 9-S9	Sask	0.202	0.300	0.207	0.330	0.67	0.69	Neg
457 9-S10	Sask	0.264	0.300	0.169	0.330	0.88	0.56	Neg
458 9-S11	Sask	0.425	0.300	0.483	0.330	1.42	1.61	Both +
459 9-S12	Sask	0.346	0.300	0.335	0.330	1.15	1.12	Both +
460 9-S13	Sask	0.383	0.300	0.349	0.330	1.28	1.16	Both +
461 9-S14	Sask	0.174	0.300	0.146	0.330	0.58	0.49	Neg
462 9-S15	Sask	0.474	0.300	0.362	0.330	1.58	1.21	Both +
463 9-S16	Sask	0.315	0.300	0.274	0.330	1.05	0.91	sar55 +
464 9-S17	Sask	0.192	0.300	0.157	0.330	0.64	0.52	Neg
465 1-1	Kor	0.127	0.300	0.085	0.330	0.42	0.28	Neg
466 1-2	Kor	0.097	0.300	0.079	0.330	0.32	0.26	Neg
467 1-3	Kor	0.139	0.300	0.113	0.330	0.46	0.38	Neg
468 1-4	Kor	0.130	0.300	0.103	0.330	0.43	0.34	Neg
469 1-5	Kor	0.210	0.300	0.129	0.330	0.70	0.43	Neg

Figure 2I

Name	SampleDate	OD humSAR55	Cutoff 1	swORF2	Cutoff 2	Sample/Coff humSAR55	swORF2	Result
470 1-6	Kor	0.159	0.300	0.116	0.330	0.53	0.39	Neg
471 1-7	Kor	0.271	0.300	0.236	0.330	0.90	0.79	Neg
472 1-8	Kor	0.174	0.300	0.148	0.330	0.58	0.49	Neg
473 1-9	Kor	0.093	0.300	0.075	0.330	0.31	0.25	Neg
474 1-10	Kor	0.131	0.300	0.094	0.330	0.44	0.31	Neg
475 1-11	Kor	0.091	0.300	0.072	0.330	0.30	0.24	Neg
476 1-12	Kor	0.105	0.300	0.078	0.330	0.35	0.26	Neg
477 1-13	Kor	0.115	0.300	0.081	0.330	0.38	0.27	Neg
478 1-14	Kor	0.130	0.300	0.122	0.330	0.43	0.41	Neg
479 1-15	Kor	0.078	0.300	0.073	0.330	0.26	0.24	Neg
480 1-16	Kor	0.101	0.300	0.076	0.330	0.34	0.25	Neg
481 1-17	Kor	0.128	0.300	0.082	0.330	0.43	0.27	Neg
482 1-18	Kor	0.132	0.300	0.081	0.330	0.44	0.27	Neg
483 1-19	Kor	0.109	0.300	0.075	0.330	0.36	0.25	Neg
484 1-20	Kor	0.185	0.300	0.155	0.330	0.62	0.52	Neg
485 2-1	Kor	0.661	0.300	0.655	0.330	2.20	2.18	Both +
486 2-2	Kor	0.178	0.300	0.169	0.330	0.59	0.56	Neg
487 2-3	Kor	1.661	0.300	1.672	0.330	5.54	5.57	Both +
488 2-4	Kor	0.201	0.300	0.107	0.330	0.67	0.36	Neg
	Kor	0.181	0.300	0.099	0.330	0.60	0.33	Neg
	Kor	0.177	0.300	0.106	0.330	0.59	0.35	Neg
491 2-7	Kor	0.129	0.300	0.091	0.330	0.43	0.30	Neg
492 2-8	Kor	0.139	0.300	0.095	0.330	0.46	0.32	Neg
493 2-9	Kor	0.125	0.300	0.096	0.330	0.42	0.32	Neg
494 2-10	Kor	0.139	0.300	0.084	0.330	0.46	0.28	Neg
495 2-11	Kor	0.117	0.300	0.088	0.330	0.39	0.29	Neg
496 2-12	Kor	0.170	0.300	0.090	0.330	0.57	0.30	Neg
497 2-13	Kor	1.646	0.300	1.381	0.330	5.49	4.60	Both +
498 2-14	Kor	0.287	0.300	0.208	0.330	0.96	0.69	Neg
499 2-15	Kor	0.132	0.300	0.129	0.330	0.44	0.43	Neg
500 2-16	Kor	0.204	0.300	0.123	0.330	0.68	0.41	Neg
501 2-17	Kor	0.135	0.300	0.148	0.330	0.45	0.49	Neg
502 2-18	Kor	0.374	0.300	0.300	0.330	1.25	1.00	Both +
503 2-19	Kor	0.122	0.300	0.128	0.330	0.41	0.43	Neg
504 2-20	Kor	0.170	0.300	0.173	0.330	0.57	0.58	Neg
505 3-1	Kor	0.431	0.300	0.336	0.330	1.44	1.12	Both +
506 3-2	Kor	1.968	0.300	2.116	0.330	6.56	7.05	Both +
507 3-3	Kor	0.536	0.300	0.585	0.330	1.79	1.95	Both +
508 3-4	Kor	0.508	0.300	0.645	0.330	1.69	2.15	Both +
509 3-5	Kor	0.274	0.300	0.360	0.330	0.91	1.20	swORF2 +
510 3-6	Kor	0.257	0.300	0.200	0.330	0.86	0.67	Neg
511 3-7	Kor	0.081	0.300	0.089	0.330	0.27	0.30	Neg
512 3-8	Kor	0.068	0.300	0.071	0.330	0.23	0.24	Neg
513 3-9	Kor	0.102	0.300	0.100	0.330	0.34	0.33	Neg
514 3-10	Kor	0.130	0.300	0.117	0.330	0.43	0.39	Neg
515 3-11	Kor	0.303	0.300	0.353	0.330	1.01	1.18	Both +
516 3-12	Kor	1.930	0.300	2.041	0.330	6.43	6.80	Both +
517 3-13	Kor	1.584	0.300	1.767	0.330	5.28	5.89	Both +
518 3-14	Kor	0.333	0.300	0.376	0.330	1.11	1.25	Both +
519 3-15	Kor	0.912	0.300	1.187	0.330	3.04	3.96	Both +
520 3-16	Kor	0.581	0.300	0.533	0.330	1.94	1.78	Both +
521 3-17	Kor	1.098	0.300	1.228	0.330	3.66	4.09	Both +
522 3-18	Kor	1.027	0.300	1.140	0.330	3.42	3.80	Both +
523 3-19	Kor	1.530	0.300	1.970	0.330	5.10	6.57	Both +
524 3-20	Kor	1.643	0.300	1.454	0.330	5.48	4.85	Both +
1 Kor 5.1	Kor	1.927	0.326	1.447	0.325	5.91	4.45	Both +
2 Kor 5.2	Kor	1.583	0.326	1.258	0.325	4.86	3.87	Both +

Figure 2J

Name	SampleDate		OD				Sample/Coff		Result
			humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
3 Kor 5.3		Kor	0.511	0.326	0.311	0.325	1.57	0.96	sar55 +
4 Kor 5.4		Kor	0.436	0.326	0.374	0.325	1.34	1.15	Both +
5 Kor 5.5		Kor	0.645	0.326	0.356	0.325	1.98	1.10	Both +
6 Kor 5.6		Kor	2.678	0.326	2.278	0.325	8.21	7.01	Both +
7 Kor 5.7		Kor	1.309	0.326	0.812	0.325	4.02	2.50	Both +
8 Kor 5.8		Kor	0.230	0.326	0.161	0.325	0.71	0.50	Neg
9 Kor 5.9		Kor	0.246	0.326	0.181	0.325	0.75	0.56	Neg
10 Kor 5.10		Kor	2.185	0.326	1.464	0.325	6.70	4.50	Both +
11 Kor 5.11		Kor	0.281	0.326	0.241	0.325	0.86	0.74	Neg
12 Kor 5.12		Kor	0.166	0.326	0.127	0.325	0.51	0.39	Neg
13 Kor 5.13		Kor	0.168	0.326	0.102	0.325	0.52	0.31	Neg
14 Kor 5.14		Kor	0.379	0.326	0.267	0.325	1.16	0.82	sar55 +
15 Kor 5.15		Kor	0.338	0.326	0.252	0.325	1.04	0.78	sar55 +
16 Kor 5.16		Kor	0.242	0.326	0.163	0.325	0.74	0.50	Neg
17 Kor 5.17		Kor	0.182	0.326	0.114	0.325	0.56	0.35	Neg
18 Kor 5.18		Kor	0.199	0.326	0.137	0.325	0.61	0.42	Neg
19 Kor 5.19		Kor	0.330	0.326	0.180	0.325	1.01	0.55	sar55 +
20 Kor 5.20		Kor	0.277	0.326	0.180	0.325	0.85	0.55	Neg
21 Kor 6.1		Kor	0.387	0.326	0.222	0.325	1.19	0.68	sar55 +
22 Kor 6.2		Kor	0.137	0.326	0.091	0.325	0.42	0.28	Neg
23 Kor 6.3		Kor	1.444	0.326	0.892	0.325	4.43	2.74	Both +
24 Kor 6.4		Kor	0.709	0.326	0.461	0.325	2.17	1.42	Both +
25 Kor 6.5		Kor	0.359	0.326	0.233	0.325	1.10	0.72	sar55 +
26 Kor 6.6		Kor	1.531	0.326	1.147	0.325	4.70	3.53	Both +
27 Kor 6.7		Kor	0.305	0.326	0.137	0.325	0.94	0.42	Neg
28 Kor 6.8		Kor	0.793	0.326	0.544	0.325	2.43	1.67	Both +
29 Kor 6.9		Kor	0.687	0.326	0.456	0.325	2.11	1.40	Both +
30 Kor 6.10		Kor	0.271	0.326	0.199	0.325	0.83	0.61	Neg
31 Kor 6.11		Kor	0.109	0.326	0.077	0.325	0.33	0.24	Neg
32 Kor 6.12		Kor	0.622	0.326	0.382	0.325	1.91	1.18	Both +
33 Kor 6.13		Kor	0.135	0.326	0.076	0.325	0.41	0.23	Neg
34 Kor 6.14		Kor	0.648	0.326	0.444	0.325	1.99	1.37	Both +
35 Kor 6.15		Kor	0.136	0.326	0.096	0.325	0.42	0.30	Neg
36 Kor 6.16		Kor	0.664	0.326	0.515	0.325	2.04	1.58	Both +
37 Kor 6.19		Kor	0.667	0.326	0.520	0.325	2.05	1.60	Both +
38 Kor 6.20		Kor	0.115	0.326	0.099	0.325	0.35	0.30	Neg
1 Kor 8.1		Kor	0.452	0.337	0.599	0.328	1.34	1.83	Both +
2 Kor 8.2		Kor	0.244	0.337	0.248	0.328	0.72	0.75	Neg
3 Kor 8.3		Kor	1.167	0.337	1.249	0.328	3.46	3.81	Both +
4 Kor 8.4		Kor	0.532	0.337	0.451	0.328	1.58	1.38	Both +
5 Kor 8.5		Kor	0.548	0.337	0.670	0.328	1.63	2.04	Both +
6 Kor 8.6		Kor	0.842	0.337	0.948	0.328	2.50	2.89	Both +
7 Kor 8.7		Kor	0.055	0.337	0.058	0.328	0.16	0.18	Neg
8 Kor 8.8		Kor	0.935	0.337	0.674	0.328	2.77	2.05	Both +
9 Kor 8.9		Kor	1.115	0.337	1.021	0.328	3.31	3.11	Both +
10 Kor 8.10		Kor	0.581	0.337	0.292	0.328	1.72	0.89	sar55 +
11 Kor 8.11		Kor	0.056	0.337	0.059	0.328	0.17	0.18	Neg
12 Kor 8.12		Kor	0.198	0.337	0.213	0.328	0.59	0.65	Neg
13 Kor 8.13		Kor	0.620	0.337	0.673	0.328	1.84	2.05	Both +
14 Kor 8.14		Kor	0.787	0.337	0.699	0.328	2.34	2.13	Both +
15 Kor 8.15		Kor	0.510	0.337	0.374	0.328	1.51	1.14	Both +
16 Kor 8.16		Kor	1.646	0.337	1.681	0.328	4.88	5.13	Both +
17 Kor 8.17		Kor	0.147	0.337	0.111	0.328	0.44	0.34	Neg
18 Kor 8.18		Kor	0.461	0.337	0.357	0.328	1.37	1.09	Both +
19 Kor 8.19		Kor	0.304	0.337	0.245	0.328	0.90	0.75	Neg
20 Kor 8.20		Kor	0.146	0.337	0.119	0.328	0.43	0.36	Neg
21 CM1-1		Kor	0.540	0.337	0.368	0.328	1.60	1.12	Both +

Figure 2K

Name	SampleDate	OD				Sample/Coff		Result
		humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
22 CM1-2	Kor	0.312	0.337	0.250	0.328	0.93	0.76	Neg
23 CM1-3	Kor	0.305	0.337	0.367	0.328	0.91	1.12	swORF2 +
24 CM1-4	Kor	1.615	0.337	1.606	0.328	4.79	4.90	Both +
25 CM1-5	Kor	1.051	0.337	1.074	0.328	3.12	3.27	Both +
26 CM1-6	Kor	0.435	0.337	0.231	0.328	1.29	0.70	sar55 +
27 CM1-7	Kor	0.548	0.337	0.379	0.328	1.63	1.16	Both +
28 CM1-8	Kor	0.408	0.337	0.417	0.328	1.21	1.27	Both +
29 CM1-9	Kor	1.231	0.337	0.961	0.328	3.65	2.93	Both +
30 CM1-10	Kor	0.608	0.337	0.533	0.328	1.80	1.63	Both +
31 CM1-11	Kor	0.367	0.337	0.326	0.328	1.09	0.99	sar55 +
32 CM2-1	Kor	1.145	0.337	0.834	0.328	3.40	2.54	Both +
33 CM2-2	Kor	0.477	0.337	0.407	0.328	1.42	1.24	Both +
34 CM2-3	Kor	0.761	0.337	0.523	0.328	2.26	1.59	Both +
35 CM2-4	Kor	1.499	0.337	1.812	0.328	4.45	5.52	Both +
36 CM2-5	Kor	0.342	0.337	0.423	0.328	1.01	1.29	Both +
37 CM2-6	Kor	0.422	0.337	0.601	0.328	1.25	1.83	Both +
38 CM2-7	Kor	0.264	0.337	0.255	0.328	0.78	0.7	Neg
39 CM2-8	Kor	0.358	0.337	0.299	0.328	1.06	0.91	sar55 +
40 CM2-9	Kor	0.329	0.337	0.260	0.328	0.98	0.79	Neg
41 CM2-10	Kor	0.308	0.337	0.430	0.328	0.91	1.31	swORF2 +
42 CM3-1	Kor	0.259	0.337	0.335	0.328	0.77	1.02	swORF2 +
43 CM3-2	Kor	0.279	0.337	0.233	0.328	0.83	0.71	Neg
44 CM3-3	Kor	0.657	0.337	0.628	0.328	1.95	1.91	Both +
45 CM3-4	Kor	0.591	0.337	0.371	0.328	1.75	1.13	Both +
46 CM3-5	Kor	0.161	0.337	0.108	0.328	0.48	0.33	Neg
47 CM3-6	Kor	0.195	0.337	0.238	0.328	0.58	0.73	Neg
48 CM3-7	Kor	0.573	0.337	0.585	0.328	1.70	1.78	Both +
49 CM3-8	Kor	0.482	0.337	0.471	0.328	1.43	1.44	Both +
50 CM3-9	Kor	0.345	0.337	0.285	0.328	1.02	0.87	sar55 +
51 CM3-10	Kor	0.434	0.337	0.203	0.328	1.29	0.62	sar55 +
52 CM4-1	Kor	0.290	0.337	0.308	0.328	0.86	0.94	Neg
53 CM4-2	Kor	0.780	0.337	0.691	0.328	2.31	2.11	Both +
54 CM4-3	Kor	0.751	0.337	0.541	0.328	2.23	1.65	Both +
55 CM4-4	Kor	0.434	0.337	0.376	0.328	1.29	1.15	Both +
56 CM4-5	Kor	0.600	0.337	0.476	0.328	1.78	1.45	Both +
57 CM4-6	Kor	1.034	0.337	0.803	0.328	3.07	2.45	Both +
58 CM4-7	Kor	1.079	0.337	0.776	0.328	3.20	2.37	Both +
59 CM4-8	Kor	0.443	0.337	0.564	0.328	1.31	1.72	Both +
60 CM4-9	Kor	0.452	0.337	0.509	0.328	1.34	1.55	Both +
61 CM4-10	Kor	1.025	0.337	1.042	0.328	3.04	3.18	Both +
62 CM5-1	Kor	2.209	0.337	2.007	0.328	6.55	6.12	Both +
63 CM5-2	Kor	0.309	0.337	0.324	0.328	0.92	0.99	Neg
64 CM5-3	Kor	2.100	0.337	1.996	0.328	6.23	6.09	Both +
65 CM5-4	Kor	0.180	0.337	0.125	0.328	0.53	0.38	Neg
66 CM5-5	Kor	0.156	0.337	0.097	0.328	0.46	0.30	Neg
67 CM5-6	Kor	1.311	0.337	1.035	0.328	3.89	3.16	Both +
68 CM5-7	Kor	1.950	0.337	1.686	0.328	5.79	5.14	Both +
69 CM5-8	Kor	0.176	0.337	0.117	0.328	0.52	0.36	Neg
70 CM5-9	Kor	0.168	0.337	0.135	0.328	0.50	0.41	Neg
71 CM5-10	Kor	0.664	0.337	0.782	0.328	1.97	2.38	Both +
72 CM6-1	Kor	0.215	0.337	0.297	0.328	0.64	0.91	Neg
73 CM6-2	Kor	0.280	0.337	0.263	0.328	0.83	0.80	Neg
74 CM6-3	Kor	0.318	0.337	0.342	0.328	0.94	1.04	swORF2 +
75 CM6-4	Kor	0.305	0.337	0.216	0.328	0.91	0.66	Neg
76 CM6-5	Kor	0.182	0.337	0.135	0.328	0.54	0.41	Neg
77 CM6-6	Kor	0.301	0.337	0.279	0.328	0.89	0.85	Neg
78 CM6-7	Kor	0.216	0.337	0.178	0.328	0.64	0.54	Neg

Figure 2L

Name	SampleDate	OD humSAR55	Cutoff 1	swORF2	Cutoff 2	Sample/Coff humSAR55	swORF2	Result
79 CM6-8	Kor	0.231	0.337	0.192	0.328	0.69	0.59	Neg
80 CM6-9	Kor	0.240	0.337	0.177	0.328	0.71	0.54	Neg
81 CM6-10	Kor	0.357	0.337	0.239	0.328	1.06	0.73	sar55 +
82 CAD-1	Kor	0.162	0.337	0.124	0.328	0.48	0.38	Neg
83 CAD-2	Kor	0.154	0.337	0.115	0.328	0.46	0.35	Neg
84 CAD-3	Kor	0.152	0.337	0.251	0.328	0.45	0.77	Neg
85 CAD-4	Kor	1.052	0.337	0.849	0.328	3.12	2.59	Both +
86 CAD-5	Kor	1.014	0.337	0.882	0.328	3.01	2.68	Both +
87 CAD-6	Kor	1.699	0.337	1.276	0.328	5.04	3.89	Both +
88 CAD-7	Kor	0.286	0.337	0.197	0.328	0.85	0.60	Neg
89 CAD-8	Kor	0.514	0.337	0.363	0.328	1.53	1.11	Both +
90 CAD-9	Kor	0.590	0.337	0.479	0.328	1.75	1.46	Both +
91 CAD-10	Kor	0.655	0.337	0.341	0.328	1.94	1.04	Both +
92 CAD-11	Kor	1.348	0.332	1.536	0.328	4.00	4.68	Both +
3 0301012999-1DO	USA1	0.618	0.332	0.575	0.327	1.86	1.76	Both +
4 0301012999-2DO	USA1	0.838	0.332	0.715	0.327	2.52	2.19	Both +
5 0301012999-3DO	USA1	0.509	0.332	0.436	0.327	1.53	1.33	Both +
6 0301012999-4DO	USA1	0.121	0.332	0.084	0.327	0.36	0.26	Neg
7 0301012999-5DO	USA1	0.435	0.332	0.407	0.327	1.31	1.24	Both +
8 0301012999-6DO	USA1	0.154	0.332	0.067	0.327	0.46	0.20	Neg
9 0301012999-7DO	USA1	0.109	0.332	0.085	0.327	0.33	0.26	Neg
10 0301012999-8DO	USA1	0.606	0.332	0.456	0.327	1.83	1.39	Both +
11 0301012999-9DO	USA1	0.100	0.332	0.061	0.327	0.30	0.19	Neg
12 0301012999-10DO	USA1	0.304	0.332	0.326	0.327	0.92	1.00	Neg
3 1	2/25/00 USA1	0.183	0.332	0.219	0.329	0.55	0.67	Neg
4 2	2/25/00 USA1	0.629	0.332	0.796	0.329	1.89	2.42	Both +
5 3	2/25/00 USA1	0.091	0.332	0.133	0.329	0.27	0.40	Neg
6 4	2/25/00 USA1	0.141	0.332	0.154	0.329	0.42	0.47	Neg
7 5	2/25/00 USA1	0.081	0.332	0.092	0.329	0.24	0.28	Neg
8 6	2/25/00 USA1	0.228	0.332	0.300	0.329	0.69	0.91	Neg
9 7	2/25/00 USA1	0.210	0.332	0.231	0.329	0.63	0.70	Neg
10 8	2/25/00 USA1	0.105	0.332	0.113	0.329	0.32	0.34	Neg
11 9	2/25/00 USA1	0.071	0.332	0.097	0.329	0.21	0.29	Neg
12 10	2/25/00 USA1	0.080	0.332	0.103	0.329	0.24	0.31	Neg
13 11	2/25/00 USA1	0.064	0.332	0.076	0.329	0.19	0.23	Neg
14 12	2/25/00 USA1	0.380	0.332	0.500	0.329	1.14	1.52	Both +
15 13	2/25/00 USA1	0.527	0.332	0.600	0.329	1.59	1.82	Both +
16 14	2/25/00 USA1	0.068	0.332	0.079	0.329	0.20	0.24	Neg
17 15	2/25/00 USA1	0.100	0.332	0.150	0.329	0.30	0.46	Neg
18 16	2/25/00 USA1	0.223	0.332	0.281	0.329	0.67	0.85	Neg
19 17	2/25/00 USA1	0.125	0.332	0.148	0.329	0.38	0.45	Neg
20 18	2/25/00 USA1	0.633	0.332	0.826	0.329	1.91	2.51	Both +
21 19	2/25/00 USA1	0.178	0.332	0.192	0.329	0.54	0.58	Neg
22 20	2/25/00 USA1	0.351	0.332	0.373	0.329	1.06	1.13	Both +
23 21	2/25/00 USA1	0.564	0.332	0.623	0.329	1.70	1.89	Both +
24 22	2/25/00 USA1	0.070	0.332	0.068	0.329	0.21	0.21	Neg
25 23	2/25/00 USA1	0.088	0.332	0.102	0.329	0.27	0.31	Neg
26 24	2/25/00 USA1	0.072	0.332	0.072	0.329	0.22	0.22	Neg
27 25	2/25/00 USA1	0.076	0.332	0.072	0.329	0.23	0.22	Neg
28 26	2/25/00 USA1	0.206	0.332	0.316	0.329	0.62	0.96	Neg
29 27	2/25/00 USA1	0.212	0.332	0.257	0.329	0.64	0.78	Neg
30 28	2/25/00 USA1	0.319	0.332	0.424	0.329	0.96	1.29	swORF2 +
31 29	2/25/00 USA1	0.072	0.332	0.084	0.329	0.22	0.26	Neg
32 30	2/25/00 USA1	0.067	0.332	0.079	0.329	0.20	0.24	Neg
33 31	2/25/00 USA1	0.061	0.332	0.066	0.329	0.18	0.20	Neg
34 32	2/25/00 USA1	0.238	0.332	0.300	0.329	0.72	0.91	Neg
35 33	2/25/00 USA1	0.093	0.332	0.107	0.329	0.28	0.33	Neg

Figure 2M

Name	SampleDate	OD humSAR55	Cutoff 1	swORF2	Cutoff 2	Sample/Coff humSAR55	swORF2	Result
36 34	2/25/00 USA1	0.320	0.332	0.316	0.329	0.96	0.97	Neg
37 35	2/25/00 USA1	0.093	0.332	0.128	0.329	0.28	0.39	Neg
38 36	2/25/00 USA1	0.223	0.332	0.372	0.329	0.67	1.13	swORF2 +
39 37	2/25/00 USA1	0.065	0.332	0.071	0.329	0.20	0.22	Neg
40 38	2/25/00 USA1	0.121	0.332	0.157	0.329	0.36	0.48	Neg
41 39	2/25/00 USA1	0.116	0.332	0.161	0.329	0.35	0.49	Neg
42 40	2/25/00 USA1	0.174	0.332	0.234	0.329	0.52	0.71	Neg
5 2-1712	3/22/00 USA1	0.602	0.332	0.428	0.300	1.81	1.43	Both +
6 9-7115	3/22/00 USA1	0.364	0.332	0.120	0.300	1.10	0.40	sar55 +
7 1-1180	3/22/00 USA1	0.159	0.332	0.198	0.300	0.48	0.66	Neg
7 20-7260	3/22/00 USA1	0.272	0.332	0.106	0.300	0.82	0.35	Neg
8 2-1712	3/22/00 USA1	0.422	0.332	0.397	0.300	1.27	1.32	Both +
8 24-7315	3/22/00 USA1	0.339	0.332	0.174	0.300	1.02	0.58	sar55 +
9 29-7333	3/22/00 USA1	0.209	0.332	0.087	0.300	0.63	0.29	Neg
9 3-4511	3/22/00 USA1	0.121	0.332	0.143	0.300	0.36	0.48	Neg
10 30-7334	3/22/00 USA1	0.233	0.332	0.077	0.300	0.70	0.26	Neg
10 4-6710	3/22/00 USA1	0.135	0.332	0.130	0.300	0.41	0.43	Neg
11 34-41746	3/22/00 USA1	0.468	0.332	0.241	0.300	1.41	0.80	sar55 +
[illegible]	3/22/00 USA1	0.094	0.332	0.118	0.300	0.28	0.39	Neg
[illegible]	3/22/00 USA1	0.301	0.332	0.179	0.300	0.91	0.60	Neg
12 6-6847	3/22/00 USA1	0.093	0.332	0.118	0.300	0.28	0.39	Neg
13 36-41	3/22/00 USA1	0.402	0.332	0.273	0.300	1.21	0.91	sar55 +
13 7-5	3/22/00 USA1	[illegible]	[illegible]	0.127	0.300	0.26	0.42	Neg
14 [illegible]	3/22/00 USA1	1.717	0.332	[illegible]	0.300	5.17	3.02	Both +
[illegible]	3/22/00 USA1	0.126	0.332	0.077	[illegible]	0.38	0.26	Neg
15 [illegible]28	3/22/00 USA1	0.618	0.332	0.510	0.300	1.86	1.70	Both +
15 9-7115	3/22/00 USA1	0.287	0.332	0.106	0.300	[illegible]	0.35	Neg
16 10-7119	3/22/00 USA1	0.118	0.332	0.097	0.300	0.36	0.32	Neg
16 39-41855	3/22/00 USA1	0.259	0.332	0.207	0.300	0.78	0.69	Neg
17 11-7127	3/22/00 USA1	0.102	0.332	0.125	0.300	0.31	0.42	Neg
17 41-41867	3/22/00 USA1	0.532	0.332	0.361	0.300	1.60	1.20	Both +
18 12-7129	3/22/00 USA1	0.184	0.332	0.107	0.300	0.55	0.36	Neg
18 42-41907	3/22/00 USA1	0.461	[illegible]32	0.332	0.300	1.39	1.11	Both +
19 13-7130	3/22/00 USA1	0.115	0.332	0.138	0.300	0.35	0.46	Neg
20 14-7132	3/22/00 USA1	0.153	0.332	0.109	0.300	0.46	0.36	Neg
21 15-7133	3/22/00 USA1	0.138	0.332	0.129	0.300	0.42	0.43	Neg
22 16-7171	3/22/00 USA1	0.106	0.338	0.089	0.300	0.31	0.30	Neg
23 17-7172	3/22/00 USA1	0.173	0.338	0.076	0.300	0.51	0.25	Neg
24 18-7199	3/22/00 USA1	0.197	0.338	0.095	0.300	0.58	0.32	Neg
25 19-7259	3/22/00 USA1	0.107	0.338	0.075	0.300	0.32	0.25	Neg
26 20-7260	3/22/00 USA1	0.213	0.338	0.089	0.300	0.63	0.30	Neg
27 21-7262	3/22/00 USA1	0.[illegible]83	0.338	0.078	0.300	0.48	0.26	Neg
28 22-7275	3/22/00 USA1	0.156	0.338	0.088	0.300	0.46	0.29	Neg
29 23-7281	3/22/00 USA1	0.164	0.338	0.093	0.300	0.49	0.31	Neg
30 24-7315	3/22/00 USA1	0.306	0.338	0.161	0.300	0.91	0.54	Neg
31 25-7316	3/22/00 USA1	0.136	0.338	0.098	0.300	0.40	0.33	Neg
32 26-7319	3/22/00 USA1	0.159	0.338	0.109	0.300	0.47	0.36	Neg
33 27-7322	3/22/00 USA1	0.127	0.338	0.096	0.300	0.38	0.35	Neg
34 28-7326	3/22/00 USA1	0.126	0.338	0.075	0.300	0.37	0.25	Neg
35 29-7333	3/22/00 USA1	0.201	0.338	0.076	0.300	0.59	0.25	Neg
36 30-7334	3/22/00 USA1	0.166	0.338	0.270	0.300	0.49	0.90	Neg
37 31-7335	3/22/00 USA1	0.189	0.338	0.073	0.300	0.56	0.24	Neg
38 32-7425	3/22/00 USA1	0.090	0.338	0.062	0.300	0.27	0.21	Neg
39 33-7446	3/22/00 USA1	0.175	0.338	0.072	0.300	0.52	0.24	Neg
40 34-41746	3/22/00 USA1	0.328	0.338	0.157	0.300	0.97	0.52	Neg
41 35-41793	3/22/00 USA1	0.208	0.338	0.135	0.300	0.62	0.45	Neg
42 36-41823	3/22/00 USA1	0.286	0.338	0.216	0.300	0.85	0.72	Neg

Figure 2N

		OD				Sample/Coff		Result
Name	SampleDate	humSAR55	Cutoff 1	swORF2	Cutoff 2	humSAR55	swORF2	
43 37-41824	3/22/00 USA1	0.957	0.338	0.483	0.300	2.83	1.61	Both +
44 38-41828	3/22/00 USA1	0.418	0.338	0.284	0.300	1.24	0.95	sar55 +
45 39-41855	3/22/00 USA1	0.212	0.338	0.143	0.300	0.63	0.48	Neg
46 40-41863	3/22/00 USA1	0.178	0.338	0.129	0.300	0.53	0.43	Neg
47 41-41867	3/22/00 USA1	0.489	0.338	0.307	0.300	1.45	1.02	Both +
48 42-41907	3/22/00 USA1	0.362	0.338	0.324	0.300	1.07	1.08	Both +
49 R7-0799007	3/22/00 USA1	0.089	0.338	0.055	0.300	0.26	0.18	Neg
50 R31	3/22/00 USA1	0.070	0.338	0.059	0.300	0.21	0.20	Neg
51 R33	3/22/00 USA1	0.086	0.338	0.058	0.300	0.25	0.19	Neg
52 R48-0799038	3/22/00 USA1	0.065	0.338	0.060	0.300	0.19	0.20	Neg
53 R49	3/22/00 USA1	0.082	0.338	0.064	0.300	0.24	0.21	Neg
54 R66-0799049	3/22/00 USA1	0.094	0.338	0.062	0.300	0.28	0.21	Neg
55 R80-0799056	3/22/00 USA1	0.074	0.338	0.060	0.300	0.22	0.20	Neg
56 R134	3/22/00 USA1	0.115	0.338	0.058	0.300	0.34	0.19	Neg
57 R139	3/22/00 USA1	0.162	0.338	0.065	0.300	0.48	0.22	Neg
58 R150	3/22/00 USA1	0.090	0.338	0.056	0.300	0.27	0.19	Neg
59 R168-0799244	3/22/00 USA1	0.099	0.338	0.055	0.300	0.29	0.18	Neg
60 R169-0799249	3/22/00 USA1	0.097	0.338	0.076	0.300	0.29	0.25	Neg
61 R195	3/22/00 USA1	0.058	0.338	0.052	0.300	0.17	0.17	Neg
62 R197	3/22/00 USA1	0.067	0.338	0.050	0.300	0.20	0.17	Neg
63 R199	3/22/00 USA1	0.084	0.338	0.055	0.300	0.25	0.18	Neg
64 R213	3/22/00 USA1	0.087	0.338	0.060	0.300	0.26	0.20	Neg
65 R219	3/22/00 USA1	0.099	0.338	0.056	0.300	0.29	0.19	Neg
66 R242	3/22/00 USA1	0.098	0.338	0.060	0.300	0.29	0.20	Neg
67 R246	3/22/00 USA1	0.095	0.338	0.058	0.300	0.28	0.19	Neg
68 R299	3/22/00 USA1	0.124	0.338	0.060	0.300	0.37	0.20	Neg
69 R346	3/22/00 USA1	0.131	0.338	0.061	0.300	0.39	0.20	Neg
70 R347	3/22/00 USA1	0.077	0.338	0.057	0.300	0.23	0.19	Neg
71 R361	3/22/00 USA1	0.106	0.338	0.065	0.300	0.31	0.22	Neg
72 R370	3/22/00 USA1	0.087	0.338	0.074	0.300	0.26	0.25	Neg
73 R374	3/22/00 USA1	0.062	0.338	0.052	0.300	0.18	0.17	Neg
74 Y22-0799115	3/22/00 USA1	0.062	0.338	0.053	0.300	0.18	0.18	Neg
75 Y24-0799118	3/22/00 USA1	0.073	0.338	0.061	0.300	0.22	0.20	Neg
76 Y26	3/22/00 USA1	0.065	0.338	0.051	0.300	0.19	0.17	Neg
77 Y37	3/22/00 USA1	0.082	0.338	0.051	0.300	0.24	0.17	Neg
78 Y42	3/22/00 USA1	0.095	0.338	0.167	0.300	0.28	0.56	Neg
79 Y43	3/22/00 USA1	0.065	0.338	0.054	0.300	0.19	0.18	Neg
80 Y45	3/22/00 USA1	0.108	0.338	0.056	0.300	0.32	0.19	Neg
81 Y47	3/22/00 USA1	0.120	0.338	0.056	0.300	0.36	0.19	Neg
82 Y48	3/22/00 USA1	0.083	0.338	0.055	0.300	0.25	0.18	Neg
83 Y49-0799139	3/22/00 USA1	0.073	0.338	0.056	0.300	0.22	0.19	Neg
84 Y51-0799141	3/22/00 USA1	0.080	0.338	0.068	0.300	0.24	0.23	Neg
85 Y52	3/22/00 USA1	0.066	0.338	0.056	0.300	0.20	0.19	Neg
86 Y54-0799143	3/22/00 USA1	0.068	0.338	0.054	0.300	0.20	0.18	Neg
87 Y66-0799155	3/22/00 USA1	0.060	0.338	0.053	0.300	0.18	0.18	Neg
88 Y68	3/22/00 USA1	0.085	0.338	0.054	0.300	0.25	0.18	Neg
89 Y74	3/22/00 USA1	0.084	0.338	0.060	0.300	0.25	0.20	Neg
90 Y83	3/22/00 USA1	0.126	0.338	0.052	0.300	0.37	0.17	Neg
91 Y89	3/22/00 USA1	0.125	0.338	0.053	0.300	0.37	0.18	Neg
92 Y90	3/22/00 USA1	0.063	0.338	0.054	0.300	0.19	0.18	Neg
93 Y94	3/22/00 USA1	0.075	0.338	0.057	0.300	0.22	0.19	Neg
94 Y77-0799291	3/22/00 USA1	0.089	0.338	0.054	0.300	0.26	0.18	Neg

Figure 20

Overall		Sar55		
SwORF2		Neg	Pos	Total
	Neg	476	35	511
	Pos	24	257	281
		500	292	792
				κ= 0.839

USA		Sar55		
SwORF2		Neg	Pos	Total
	Neg	286	5	291
	Pos	8	61	69
		294	66	360
				κ= 0.882

Korea		Sar55		
SwORF2		Neg	Pos	Total
	Neg	88	13	101
	Pos	5	84	89
		93	97	190
				κ= 0.811

Canada		Sar55		
SwORF2		Neg	Pos	Total
	Neg	51	15	66
	Pos	6	80	86
		57	95	152
				κ= 0.714

Thailand		Sar55		
SwORF2		Neg	Pos	Total
	Neg	26	0	26
	Pos	5	29	34
		31	29	60
				κ= 0.834

China		Sar55		
SwORF2		Neg	Pos	Total
	Neg	25	2	27
	Pos	0	3	3
		25	5	30
				κ= 0.714

Figure 3A

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
3 P1		ThaiPH	0.200	0.328	0.144	0.300	0.67	0.48		Neg
4 P2		ThaiPH	0.265	0.328	0.179	0.300	0.88	0.60		Neg
5 P3		ThaiPH	0.836	0.328	0.642	0.300	2.79	2.14	18.56	Both +
6 P4		ThaiPH	0.126	0.328	0.114	0.300	0.42	0.38		Neg
7 P5		ThaiPH	0.121	0.328	0.107	0.300	0.40	0.36		Neg
8 P6		ThaiPH	0.136	0.328	0.116	0.300	0.45	0.39		Neg
9 P7		ThaiPH	0.122	0.328	0.108	0.300	0.41	0.36		Neg
10 CP-1		ChiPH	0.875	0.328	0.922	0.300	2.92	3.07	3.70	Both +
11 CP-2		ChiPH	0.899	0.328	0.885	0.300	3.00	2.95	1.11	Both +
12 CP-3		ChiPH	0.875	0.328	0.939	0.300	2.92	3.13	4.99	Both +
13 CP-4		ChiPH	1.101	0.328	1.048	0.300	3.67	3.49	3.49	Both +
14 CP-5		ChiPH	0.957	0.328	0.901	0.300	3.19	3.00	4.26	Both +
15 CP-6		ChiPH	1.034	0.328	0.860	0.300	3.45	2.87	12.99	Both +
16 CP-7		ChiPH	0.984	0.328	0.801	0.300	3.28	2.67	14.50	Both +
17 CP-8		ChiPH	1.014	0.328	0.867	0.300	3.38	2.89	11.05	Both +
18 CP-9		ChiPH	0.973	0.328	0.835	0.300	3.24	2.78	10.79	Both +
19 CP-10		ChiPH	0.923	0.328	0.780	0.300	3.08	2.60	11.88	Both +
20 CP-11		ChiPH	0.956	0.328	0.859	0.300	3.19	2.86	7.56	Both +
21 HD1		ChinBD	0.143	0.328	0.110	0.300	0.48	0.37		Neg
22 HD2		ChinBD	0.144	0.328	0.123	0.300	0.48	0.41		Neg
23 HD3		ChinBD	0.103	0.328	0.095	0.300	0.34	0.32		Neg
24 HD4		ChinBD	0.077	0.328	0.081	0.300	0.26	0.27		Neg
25 HD5		ChinBD	1.028	0.328	1.137	0.300	3.43	3.79	7.12	Both +
26 HD6		ChinBD	0.533	0.328	0.427	0.300	1.78	1.42	15.62	Both +
27 HD7		ChinBD	0.082	0.328	0.072	0.300	0.27	0.24		Neg
28 HD8		ChinBD	0.067	0.328	0.068	0.300	0.22	0.23		Neg
29 HD9		ChinBD	2.329	0.328	1.967	0.300	7.76	6.56	11.92	Both +
30 HD10		ChinBD	0.085	0.328	0.077	0.300	0.28	0.26		Neg
31 HD11		ChinBD	0.080	0.328	0.074	0.300	0.27	0.25		Neg
32 HD12		ChinBD	0.072	0.328	0.069	0.300	0.24	0.23		Neg
33 HD13		ChinBD	0.078	0.328	0.072	0.300	0.26	0.24		Neg
34 HD14		ChinBD	0.111	0.328	0.086	0.300	0.37	0.29		Neg
35 HD15		ChinBD	0.195	0.328	0.184	0.300	0.65	0.61		Neg
36 HD16		ChinBD	1.628	0.328	1.383	0.300	5.43	4.61	11.51	Both +
37 HD17		ChinBD	0.103	0.328	0.096	0.300	0.34	0.32		Neg
38 HD18		ChinBD	0.172	0.328	0.168	0.300	0.57	0.56		Neg
39 HD19		ChinBD	0.100	0.328	0.071	0.300	0.33	0.24		Neg
40 HD20		ChinBD	0.083	0.328	0.073	0.300	0.28	0.24		Neg
41 HD21		ChinBD	0.140	0.328	0.127	0.300	0.47	0.42		Neg
42 RH1		ChinBD	0.276	0.328	0.194	0.300	0.92	0.65		Neg
43 RH2		ChinBD	0.186	0.328	0.167	0.300	0.62	0.56		Neg
44 RH3		ChinBD	0.242	0.328	0.184	0.300	0.81	0.61		Neg
45 RH4		ChinBD	0.265	0.328	0.277	0.300	0.88	0.92		Neg
46 RH5		ChinBD	0.198	0.328	0.205	0.300	0.66	0.68		Neg
47 RH6		ChinBD	0.205	0.328	0.211	0.300	0.68	0.70		Neg
48 RH7		ChinBD	0.169	0.328	0.169	0.300	0.56	0.56		Neg
49 RH8		ChinBD	0.118	0.328	0.102	0.300	0.39	0.34		Neg
50 RH9		ChinBD	0.386	0.328	0.307	0.300	1.29	1.02	16.12	Both +
51 RH10		ChinBD	0.072	0.328	0.068	0.300	0.24	0.23		Neg
3	3573	Lcl BD	0.123	0.342	0.255	0.331	0.36	0.77		Neg
4	3566	Lcl BD	0.092	0.342	0.130	0.331	0.27	0.39		Neg
5	3562	Lcl BD	0.334	0.342	0.816	0.331	0.98	2.47		swORF2 +
6	3564	Lcl BD	0.078	0.342	0.134	0.331	0.23	0.40		Neg
7	3563	Lcl BD	0.072	0.342	0.121	0.331	0.21	0.37		Neg
8	3572	Lcl BD	0.067	0.342	0.108	0.331	0.20	0.33		Neg
9	3571	Lcl BD	0.063	0.342	0.110	0.331	0.18	0.33		Neg

Figure 3B

anti-HEV EIA			OD				Sample/Coff			
	Name	SampleDate	humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	Result
10	3570	Lot BD	0.144	0.342	0.257	0.331	0.42	0.78		Neg
11	3569	Lot BD	0.764	0.342	0.667	0.331	2.23	2.02	7.28	Both +
12	3568	Lot BD	0.070	0.342	0.098	0.331	0.20	0.30		Neg
13	3567	Lot BD	0.060	0.342	0.056	0.331	0.18	0.17		Neg
14	3561	Lot BD	0.138	0.342	0.175	0.331	0.40	0.53		Neg
15	12365	Lot BD	0.392	0.342	0.416	0.331	1.15	1.26	6.51	Both +
16	12366	Lot BD	0.192	0.342	0.250	0.331	0.56	0.76		Neg
17	12367	Lot BD	0.515	0.342	0.400	0.331	1.51	1.21	15.49	Both +
18	532	Lot BD	0.071	0.342	0.093	0.331	0.21	0.28		Neg
19	533	Lot BD	0.091	0.342	0.113	0.331	0.27	0.34		Neg
20	534	Lot BD	0.086	0.342	0.345	0.331	0.25	1.04		swORF2 +
21	547	Lot BD	0.232	0.342	0.196	0.331	0.68	0.59		Neg
22	12361	Lot BD	0.066	0.342	0.118	0.331	[illegible]	0.36		Neg
23	548	Lot BD	1.843	0.342	1.74[illegible]	0.331	[illegible]	5.27	1.51	Both +
24	1721	Lot BD	2.770	0.342	[illegible]		[illegible]	7.82	2.52	Both +
25	536	Lot BD	1.078	0.342	[illegible]		[illegible]	2.78	8.88	Both +
26	1722	Lot BD	0.069	0.342	[illegible]		[illegible]	0.37		Neg
27	535	Lot BD	0.085	[illegible]	[illegible]		[illegible]	0.50		Neg
28	1723	Lot BD	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		Neg
29	1724	Lot BD	[illegible]	[illegible]	[illegible]		[illegible]	0.38		Neg
30	1725	Lot BD	0.066	0.342	[illegible]		[illegible]	0.28		Neg
[illegible]	12371	Lot BD	0.126	0.342	[illegible]		[illegible]	0.74		Neg
[illegible]	12372	Lot BD	0.285	0.342	[illegible]		[illegible]	0.75		Neg
33	[illegible]3	Lot BD	0.090	0.342	[illegible]		[illegible]	0.29		Neg
34	123[illegible]	Lot BD	0.154	[illegible]	0.074	[illegible]331	0.45	0.22		Neg
35	3584	Lot BD	[illegible]	0.342	0.235	[illegible]31	0.43	0.71		N[illegible]
36	3585	[illegible]	[illegible]19	0.342	0.[illegible]6	0.331	0.35	0.44		Neg
37	1726	[illegible]D	0.087	0.342	0.057	0.331	0.25	0.17		Neg
38	1727	[illegible]D	0.623	0.342	2.534	[illegible]	1.82	7.66	87.06	Both +
39	12360	Lot BD	0.109	0.342	0.078	[illegible]	[illegible]2	0.24		Neg
40	12363	Lot BD	0.095	0.342	0.108	0.331	0.28	0.33		Neg
41	12364	Lot BD	0.578	0.342	0.602	0.331	1.69	1.82	5.19	Both +
42	1742	Lot BD	0.074	0.342	0.118	0.331	0.22	0.36		Neg
43	1744	Lot BD	0.076	0.342	0.106	0.331	0.22	0.32		Neg
44	3613	Lot BD	0.066	0.342	0.107	0.331	0.19	0.32		Neg
45	1733	Lot BD	0.083	0.342	0.105	0.331	0.24	0.32		Neg
46	3600	Lot BD	0.058	0.342	0.073	0.331	0.17	0.22		Neg
47	3610	Lot BD	0.062	0.342	0.062	0.331	0.18	0.19		Neg
48	3604	Lot BD	0.067	0.342	0.094	0.331	0.20	0.28		Neg
49	3594	Lot BD	0.103	0.342	0.073	0.331	0.30	0.22		Neg
50	12381	Lot BD	0.698	0.342	0.393	0.331	2.04	1.19	37.40	Both +
51	3598	Lot BD	0.214	0.342	0.216	0.331	0.63	0.65		Neg
52	12387	Lot BD	0.072	0.342	0.110	0.331	0.21	0.33		Neg
53	550	Lot BD	0.163	0.342	0.111	0.331	0.48	0.34		Neg
54	3605	Lot BD	0.145	0.342	0.100	0.331	0.42	0.30		Neg
55	1729	Lot BD	0.132	0.342	0.184	0.331	0.39	0.56		Neg
56	12382	Lot BD	0.069	0.342	0.079	0.331	0.20	0.24		Neg
57	12384	Lot BD	0.076	0.342	0.066	0.331	0.22	0.20		Neg
58	3608	Lot BD	0.124	0.342	0.108	0.331	0.36	0.33		Neg
59	1737	Lot BD	0.076	0.342	0.071	0.331	0.22	0.21		Neg
60	1732	Lot BD	0.266	0.342	0.142	0.331	0.78	0.43		Neg
61	1731	Lot BD	0.062	0.342	0.094	0.331	0.18	0.28		Neg
62	1743	Lot BD	0.071	0.342	0.083	0.331	0.21	0.25		Neg

Figure 3C

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
63	1746	Lot BD	0.061	0.342	0.085	0.331	0.18	0.26		Neg
64	1730	Lot BD	0.280	0.342	0.335	0.331	0.82	1.01		swORF2 +
65	1740	Lot BD	0.078	0.342	0.125	0.331	0.23	0.38		Neg
66	12383	Lot BD	0.101	0.342	0.079	0.331	0.30	0.24		Neg
67	12388	Lot BD	1.137	0.342	1.028	0.331	3.32	3.11	4.81	Both +
68	3592	Lot BD	0.557	0.342	0.302	0.331	1.63	0.91	39.86	sar55 +
69	3609	Lot BD	0.550	0.342	0.531	0.331	1.61	1.60	0.17	Both +
70	1735	Lot BD	0.079	0.342	0.122	0.331	0.23	0.37		Neg
71	3602	Lot BD	0.074	0.342	0.092	0.331	0.22	0.28		Neg
72	3597	Lot BD	0.142	0.342	0.059	0.331	0.42	0.18		Neg
73	12390	Lot BD	0.081	0.342	0.158	0.331	0.24	0.48		Neg
74	545	Lot BD	0.074	0.342	0.085	0.331	0.22	0.26		Neg
75	3616	Lot BD	0.090	0.342	0.104	0.331	0.26	0.31		Neg
76	3595	Lot BD	0.083	0.342	0.090	0.331	0.24	0.27		Neg
77	543	Lot BD	0.217	0.342	0.126	0.331	0.63	0.38		Neg
78	549	Lot BD	0.096	0.342	0.080	0.331	0.28	0.24		Neg
79	3606	Lot BD	0.075	0.342	0.106	0.331	0.22	0.32		Neg
80	1736	Lot BD	0.138	0.342	0.097	0.331	0.40	0.29		Neg
81	3611	Lot BD	0.267	0.342	0.124	0.331	0.78	0.37		Neg
82	1745	Lot BD	0.536	0.342	0.393	0.331	1.57	1.19	19.51	Both +
83	1728	Lot BD	0.092	0.342	0.082	0.331	0.27	0.25		Neg
84	6121	Lot BD	0.088	0.342	0.096	0.331	0.26	0.29		Neg
85	3615	Lot BD	0.062	0.342	0.083	0.331	0.18	0.25		Neg
86	1734	Lot BD	0.182	0.342	0.078	0.331	0.53	0.24		Neg
87	3599	Lot BD	0.089	0.342	0.083	0.331	0.26	0.25		Neg
88	3618	Lot BD	0.082	0.342	0.077	0.331	0.24	0.23		Neg
89	3617	Lot BD	0.063	0.342	0.082	0.331	0.18	0.25		Neg
90	12386	Lot BD	0.072	0.342	0.077	0.331	0.21	0.23		Neg
91	1739	Lot BD	0.138	0.342	0.252	0.331	0.40	0.76		Neg
92	3603	Lot BD	0.106	0.342	0.106	0.331	0.31	0.32		Neg
93	12389	Lot BD	0.076	0.342	0.077	0.331	0.22	0.23		Neg
94	3614	Lot BD	0.075	0.342	0.087	0.331	0.22	0.26		Neg
95	3593	Lot BD	0.141	0.342	0.082	0.331	0.41	0.25		Neg
3	3596	Lot BD	0.236	0.342	0.276	0.331	0.69	0.83		Neg
4	3623	Lot BD	0.290	0.342	0.267	0.331	0.85	0.81		Neg
5	3663	Lot BD	0.070	0.342	0.082	0.331	0.20	0.25		Neg
6	3622	Lot BD	0.185	0.342	0.325	0.331	0.54	0.98		Neg
7	3637	Lot BD	0.063	0.342	0.087	0.331	0.18	0.26		Neg
8	3657	Lot BD	0.082	0.342	0.116	0.331	0.24	0.35		Neg
9	3656	Lot BD	0.081	0.342	0.082	0.331	0.24	0.25		Neg
10	3655	Lot BD	0.085	0.342	0.102	0.331	0.25	0.31		Neg
11	3654	Lot BD	1.373	0.342	1.685	0.331	4.01	5.09	16.71	Both +
12	12418	Lot BD	0.113	0.342	0.098	0.331	0.33	0.30		Neg
13	12417	Lot BD	0.072	0.342	0.087	0.331	0.21	0.26		Neg
14	12392	Lot BD	1.192	0.342	1.204	0.331	3.49	3.61	3.02	Both +
15	3621	Lot BD	1.748	0.342	1.450	0.331	5.11	4.38	10.88	Both +
16	12391	Lot BD	0.070	0.342	0.078	0.331	0.20	0.24		Neg
17	3620	Lot BD	0.079	0.342	0.077	0.331	0.23	0.23		Neg
18	12416	Lot BD	1.581	0.342	1.655	0.331	4.62	5.00	5.54	Both +
19	12415	Lot BD	0.214	0.342	0.111	0.331	0.63	0.34		Neg
20	12414	Lot BD	0.065	0.342	0.084	0.331	0.19	0.25		Neg
21	552	Lot BD	0.082	0.342	0.085	0.331	0.24	0.26		Neg
22	3639	Lot BD	0.429	0.342	0.505	0.331	1.25	1.53	13.80	Both +

Figure 3D

anti-HEV EIA			OD				Sample/Coff			Result
	Name	SampleDate	humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
23	3690	Lot BD	0.064	0.342	0.058	0.331	0.19	0.18		Neg
24	12412	Lot BD	0.083	0.342	0.132	0.331	0.24	0.40		Neg
25	12410	Lot BD	0.127	0.342	0.157	0.331	0.37	0.47		Neg
26	12408	Lot BD	0.235	0.342	0.243	0.331	0.69	0.73		Neg
27	12409	Lot BD	0.070	0.342	0.086	0.331	0.20	0.26		Neg
28	12413	Lot BD	0.254	0.342	0.197	0.331	0.74	0.60		Neg
29	12425	Lot BD	0.072	0.342	0.082	0.331	0.21	0.25		Neg
30	3653	Lot BD	0.058	0.342	0.080	0.331	0.17	0.24		Neg
31	3662	Lot BD	0.937	0.342	0.977	0.331	2.74	2.95	5.27	Both +
32	1748	Lot BD	0.093	0.342	0.079	0.331	0.27	0.24		Neg
33	12411	Lot BD	0.124	0.342	0.055	0.331	0.36	0.17		Neg
34	3638	Lot BD	0.068	0.342	0.065	0.331	0.20	0.20		Neg
35	3636	Lot BD	0.102	0.342	0.122	0.331	0.30	0.37		Neg
36	12403	Lot BD	0.067	0.342	0.063	0.331	0.20	0.19		Neg
37	12424	Lot BD	0.059	0.342	0.061	0.331	0.17	0.18		Neg
38	12423	Lot BD	0.047	0.342	0.053	0.331	0.14	0.16		Neg
39	12394	Lot BD	0.071	0.342	0.149	0.331	0.21	0.45		Neg
40	50546	Lot BD	0.090	0.342	0.071	0.331	0.26	0.21		Neg
41	12393	Lot BD	0.060	0.342	0.088	0.331	0.18	0.27		Neg
42	12404	Lot BD	0.194	0.342	0.083	0.331	0.57	0.25		Neg
43	3651	Lot BD	0.057	0.342	0.079	0.331	0.17	0.24		Neg
44	12422	Lot BD	0.056	0.342	0.073	0.331	0.16	0.22		Neg
45	3649	Lot BD	0.216	0.342	0.118	0.331	0.63	0.36		Neg
46	12420	Lot BD	0.061	0.342	0.058	0.331	0.18	0.18		Neg
47	3648	Lot BD	0.069	0.342	0.080	0.331	0.20	0.24		Neg
48	3646	Lot BD	0.064	0.342	0.069	0.331	0.19	0.21		Neg
49	12406	Lot BD	0.069	0.342	0.049	0.331	0.20	0.15		Neg
50	1761	Lot BD	0.063	0.342	0.066	0.331	0.18	0.20		Neg
51	1759	Lot BD	0.073	0.342	0.080	0.331	0.21	0.24		Neg
52	12378	Lot BD	0.064	0.342	0.073	0.331	0.19	0.22		Neg
53	12377	Lot BD	0.813	0.342	1.386	0.331	2.38	4.19	39.09	Both +
54	12376	Lot BD	0.056	0.342	0.061	0.331	0.16	0.18		Neg
55	12375	Lot BD	0.483	0.342	1.062	0.331	1.41	3.21	54.97	Both +
56	3587	Lot BD	0.166	0.342	0.630	0.331	0.49	1.90		swORF2 +
57	541	Lot BD	0.062	0.342	0.075	0.331	0.18	0.23		Neg
58	539	Lot BD	0.266	0.342	0.065	0.331	0.78	0.20		Neg
59	538	Lot BD	0.074	0.342	0.100	0.331	0.22	0.30		Neg
60	12370	Lot BD	0.056	0.342	0.092	0.331	0.16	0.28		Neg
61	12369	Lot BD	2.102	0.342	2.366	0.331	6.15	7.15	10.66	Both +
62	12368	Lot BD	0.252	0.342	0.416	0.331	0.74	1.26		swORF2 +
63	3590	Lot BD	0.128	0.342	0.194	0.331	0.37	0.59		Neg
64	3589	Lot BD	0.058	0.342	0.061	0.331	0.17	0.18		Neg
65	3586	Lot BD	0.060	0.342	0.054	0.331	0.18	0.16		Neg
66	3588	Lot BD	0.059	0.342	0.084	0.331	0.17	0.25		Neg
67	12395	Lot BD	0.054	0.342	0.055	0.331	0.16	0.17		Neg
68	12396	Lot BD	0.059	0.342	0.064	0.331	0.17	0.19		Neg
69	3626	Lot BD	0.068	0.342	0.126	0.331	0.20	0.38		[illegible]
70	3627	Lot BD	0.061	0.342	0.065	0.331	0.18	0.20		Neg
71	3629	Lot BD	0.060	0.342	0.071	0.331	0.18	0.21		Neg
72	3630	Lot BD	0.715	0.342	1.134	0.331	2.09	3.43	34.23	Both +
73	1756	Lot BD	0.058	0.342	0.117	0.331	0.17	0.35		Neg
74	12405	Lot BD	0.059	0.342	0.068	0.331	0.17	0.21		Neg
75	46395	Lot BD	0.060	0.342	0.073	0.331	0.18	0.22		Neg

Figure 3E

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
76	1749	Lot BD	0.076	0.342	0.206	0.331	0.22	0.62		Neg
77	1750	Lot BD	0.081	0.342	0.088	0.331	0.24	0.27		Neg
78	12397	Lot BD	0.065	0.342	0.129	0.331	0.19	0.39		Neg
79	12398	Lot BD	0.057	0.342	0.060	0.331	0.17	0.18		Neg
80	12399	Lot BD	0.076	0.342	0.074	0.331	0.22	0.22		Neg
81	12400	Lot BD	0.943	0.342	1.643	0.331	2.76	4.96	40.41	Both +
82	1757	Lot BD	0.084	0.342	0.076	0.331	0.25	0.23		Neg
83	12407	Lot BD	0.077	0.342	0.065	0.331	0.23	0.20		Neg
84	3607	Lot BD	0.117	0.342	0.053	0.331	0.34	0.16		Neg
85	12385	Lot BD	0.059	0.342	0.063	0.331	0.17	0.19		Neg
86	3624	Lot BD	0.062	0.342	0.071	0.331	0.18	0.21		Neg
87	3641	Lot BD	0.125	0.342	0.069	0.331	0.37	0.21		Neg
88	3642	Lot BD	0.200	0.342	0.071	0.331	0.58	0.21		Neg
89	3643	Lot BD	0.166	0.342	0.052	0.331	0.49	0.16		Neg
90	1751	Lot BD	0.064	0.342	0.059	0.331	0.19	0.18		Neg
91	3644	Lot BD	0.090	0.342	0.059	0.331	0.26	0.18		Neg
92	3633	Lot BD	0.354	0.342	0.479	0.331	1.04	1.45	23.48	Both +
93	3631	Lot BD	0.058	0.342	0.054	0.331	0.17	0.16		Neg
94	3634	Lot BD	0.107	0.342	0.058	0.331	0.31	0.18		Neg
95	3632	Lot BD	0.066	0.342	0.071	0.331	0.19	0.21		Neg
3	3625	Lot BD	0.199	0.342	0.067	0.331	0.58	0.20		Neg
4	1753	Lot BD	0.097	0.342	0.09	0.331	0.28	0.27		Neg
5	1754	Lot BD	0.301	0.342	0.31	0.331	0.88	0.94		Neg
6	1752	Lot BD	0.095	0.342	0.093	0.331	0.28	0.28		Neg
7	13717-0	Lot BD	0.105	0.342	0.072	0.331	0.31	0.22		Neg
8	3645	Lot BD	0.110	0.342	0.056	0.331	0.32	0.17		Neg
9	12401	Lot BD	0.105	0.342	0.058	0.331	0.31	0.18		Neg
10	3635	Lot BD	0.168	0.342	0.075	0.331	0.49	0.23		Neg
11	12402	Lot BD	0.068	0.342	0.078	0.331	0.20	0.24		Neg
12	3628	Lot BD	0.094	0.342	0.089	0.331	0.27	0.27		Neg
13	99934222	Lot BD	0.132	0.342	0.069	0.331	0.39	0.21		Neg
14	551	Lot BD	0.140	0.342	0.065	0.331	0.41	0.20		Neg
15	9920465	Lot BD	0.531	0.342	0.340	0.331	1.55	1.03	28.80	Both +
16	99901651	Lot BD	0.086	0.342	0.075	0.331	0.25	0.23		Neg
17	99952134	Lot BD	0.168	0.342	0.088	0.331	0.49	0.27		Neg
18	99952133	Lot BD	0.148	0.342	0.082	0.331	0.43	0.25		Neg
19	99914721	Lot BD	0.083	0.342	0.092	0.331	0.24	0.28		Neg
20	3583	Lot BD	0.115	0.342	0.059	0.331	0.34	0.18		Neg
21	12362	Lot BD	0.073	0.342	0.076	0.331	0.21	0.23		Neg
22	3580	Lot BD	0.131	0.342	0.066	0.331	0.38	0.20		Neg
23	579	Lot BD	0.068	0.342	0.071	0.331	0.20	0.21		Neg
24	3578	Lot BD	0.069	0.342	0.054	0.331	0.20	0.16		Neg
25	3577	Lot BD	0.095	0.342	0.079	0.331	0.28	0.24		Neg
26	3576	Lot BD	0.107	0.342	0.070	0.331	0.31	0.21		Neg
27	3582	Lot BD	0.199	0.342	0.111	0.331	0.58	0.34		Neg
28	3575	Lot BD	0.140	0.342	0.072	0.331	0.41	0.22		Neg
29	3565	Lot BD	0.089	0.342	0.074	0.331	0.26	0.22		Neg
30	3574	Lot BD	0.093	0.342	0.095	0.331	0.27	0.29		Neg
31	3650	Lot BD	1.789	0.342	1.226	0.331	5.23	3.70	24.17	Both +
32	12421	Lot BD	0.183	0.342	0.222	0.331	0.54	0.67		Neg
33	3661	Lot BD	0.135	0.342	0.066	0.331	0.39	0.20		Neg
34	12419	Lot BD	0.126	0.342	0.058	0.331	0.37	0.18		Neg
35	3660	Lot BD	2.798	0.342	2.427	0.331	8.18	7.33	7.74	Both +

Figure 3F

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
36	3658	Lot BD	0.055	0.342	0.059	0.331	0.16	0.18		Neg
37	3659	Lot BD	0.126	0.342	0.066	0.331	0.37	0.20		Neg
38	1762	Lot BD	0.161	0.342	0.064	0.331	0.47	0.19		Neg
39	1760	Lot BD	0.223	0.342	0.072	0.331	0.65	0.22		Neg
40	1758	Lot BD	0.601	0.342	0.466	0.331	1.76	1.41	15.61	Both +
41	540	Lot BD	0.088	0.342	0.067	0.331	0.26	0.20		Neg
42	542	Lot BD	0.097	0.342	0.134	0.331	0.28	0.40		Neg
43	537	Lot BD	0.115	0.342	0.072	0.331	0.34	0.22		Neg
44	12380	Lot BD	0.468	0.342	0.437	0.331	1.37	1.32	2.53	Both +
45	12379	Lot BD	0.080	0.342	0.085	0.331	0.23	0.26		Neg
46	[illegible]47	Lot BD	0.625	0.342	0.438	0.331	1.83	1.32	22.63	Both +

Figure 3G

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
5	101	XJ PH	0.057	0.300	0.097	0.300	0.19	0.32		Neg
6	102	XJ PH	0.061	0.300	0.064	0.300	0.20	0.21		Neg
7	103	XJ PH	0.058	0.300	0.074	0.300	0.19	0.25		Neg
8	104	XJ PH	0.067	0.300	0.077	0.300	0.22	0.26		Neg
9	105	XJ PH	0.055	0.300	0.073	0.300	0.18	0.24		Neg
10	106	XJ PH	0.055	0.300	0.084	0.300	0.18	0.28		Neg
11	107	XJ PH	0.077	0.300	0.117	0.300	0.26	0.39		Neg
63	108	XJ PH	0.444	0.300	0.936	0.300	1.48	3.12	50.42	Both +
13	109	XJ PH	0.064	0.300	0.073	0.300	0.21	0.24		Neg
14	110	XJ PH	0.054	0.300	0.066	0.300	0.18	0.22		Neg
15	111	XJ PH	0.055	0.300	0.071	0.300	0.18	0.24		Neg
64	112	XJ PH	1.372	0.300	0.862	0.300	4.57	2.87	32.29	Both +
17	113	XJ PH	0.055	0.300	0.071	0.300	0.18	0.24		Neg
18	114	XJ PH	0.141	0.300	0.268	0.300	0.47	0.89		Neg
19	115	XJ PH	0.059	0.300	0.060	0.300	0.20	0.20		Neg
20	116	XJ PH	0.055	0.300	0.067	0.300	0.18	0.22		Neg
66	117	XJ PH	0.308	0.300	0.433	0.300	1.03	1.44	23.86	Both +
22	118	XJ PH	0.054	0.300	0.061	0.300	0.18	0.20		Neg
67	119	XJ PH	0.062	0.300	0.219	0.300	0.21	0.73		Neg
68	121	XJ PH	0.357	0.300	0.499	0.300	1.19	1.66	23.46	Both +
69	122	XJ PH	0.215	0.300	0.148	0.300	0.72	0.49		Neg
27	123	XJ PH	0.052	0.300	0.066	0.300	0.17	0.22		Neg
28	124	XJ PH	0.057	0.300	0.071	0.300	0.19	0.24		Neg
29	125	XJ PH	0.066	0.300	0.067	0.300	0.22	0.22		Neg
30	126	XJ PH	0.062	0.300	0.092	0.300	0.21	0.31		Neg
31	127	XJ PH	0.066	0.300	0.126	0.300	0.22	0.42		Neg
70	128	XJ PH	0.200	0.300	0.219	0.300	0.67	0.73		Neg
33	129	XJ PH	0.054	0.300	0.071	0.300	0.18	0.24		Neg
34	130	XJ PH	0.055	0.300	0.073	0.300	0.18	0.24		Neg
35	131	XJ PH	0.055	0.300	0.062	0.300	0.18	0.21		Neg
36	132	XJ PH	0.062	0.300	0.081	0.300	0.21	0.27		Neg
71	133	XJ PH	0.945	0.300	0.586	0.300	3.15	1.95	33.16	Both +
38	134	XJ PH	0.054	0.300	0.064	0.300	0.18	0.21		Neg
39	135	XJ PH	0.068	0.300	0.136	0.300	0.23	0.45		Neg
40	136	XJ PH	0.055	0.300	0.064	0.300	0.18	0.21		Neg
41	137	XJ PH	0.053	0.300	0.062	0.300	0.18	0.21		Neg
42	138	XJ PH	0.055	0.300	0.064	0.300	0.18	0.21		Neg
43	139	XJ PH	0.054	0.300	0.066	0.300	0.18	0.22		Neg
72	140	XJ PH	1.804	0.300	1.317	0.300	6.01	4.39	22.07	Both +
73	141	XJ PH	0.167	0.300	0.197	0.300	0.56	0.66		Neg
46	142	XJ PH	0.131	0.300	0.116	0.300	0.44	0.39		Neg
47	143	XJ PH	0.060	0.300	0.069	0.300	0.20	0.23		Neg
48	144	XJ PH	0.066	0.300	0.074	0.300	0.22	0.25		Neg
49	145	XJ PH	0.089	0.300	0.206	0.300	0.30	0.69		Neg
75	146	XJ PH	0.268	0.300	0.274	0.300	0.89	0.91		Neg
51	147	XJ PH	0.056	0.300	0.073	0.300	0.19	0.24		Neg
52	148	XJ PH	0.065	0.300	0.107	0.300	0.22	0.36		Neg
53	149	XJ PH	0.053	0.300	0.067	0.300	0.18	0.22		Neg
54	150	XJ PH	0.052	0.300	0.060	0.300	0.17	0.20		Neg
55	151	XJ PH	0.053	0.300	0.060	0.300	0.18	0.20		Neg
76	152	XJ PH	0.904	0.300	0.533	0.300	3.01	1.78	36.51	Both +
57	153	XJ PH	0.054	0.300	0.064	0.300	0.18	0.21		Neg
58	154	XJ PH	0.059	0.300	0.060	0.300	0.20	0.20		Neg
59	155	XJ PH	0.057	0.300	0.067	0.300	0.19	0.22		Neg
60	156	XJ PH	0.059	0.300	0.076	0.300	0.20	0.25		Neg
61	157	XJ PH	0.052	0.300	0.069	0.300	0.17	0.23		Neg
77	158	XJ PH	0.217	0.300	0.132	0.300	0.72	0.44		Neg

Figure 3H

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
63	159	XJ PH	0.060	0.300	0.071	0.300	0.20	0.24		Neg
64	160	XJ PH	0.052	0.300	0.092	0.300	0.17	0.31		Neg
65	161	XJ PH	0.054	0.300	0.084	0.300	0.18	0.28		Neg
66	162	XJ PH	0.050	0.300	0.068	0.300	0.17	0.23		Neg
67	163	XJ PH	0.053	0.300	0.069	0.300	0.18	0.23		Neg
68	164	XJ PH	0.067	0.300	0.068	0.300	0.22	0.23		Neg
69	165	XJ PH	0.058	0.300	0.060	0.300	0.19	0.20		Neg
70	166	XJ PH	0.054	0.300	0.064	0.300	0.18	0.21		Neg
71	167	XJ PH	0.310	0.300	0.707	0.300	1.03	2.36	55.21	Both +
72	168	XJ PH	0.080	0.300	0.135	0.300	0.27	0.45		Neg
73	169	XJ PH	0.086	0.300	0.204	0.300	0.29	0.68		Neg
74	170	XJ PH	0.059	0.300	0.072	0.300	0.20	0.24		Neg
75	171	XJ PH	0.054	0.300	0.064	0.300	0.18	0.21		Neg
76	172	XJ PH	0.054	0.300	0.071	0.300	0.18	0.24		Neg
77	173	XJ PH	0.074	0.300	0.084	0.300	0.25	0.28		Neg
78	174	XJ PH	0.301	0.300	0.439	0.300	1.00	1.46	26.37	Both +
79	175	XJ PH	0.075	0.300	0.071	0.300	0.25	0.24		Neg
80	176	XJ PH	0.066	0.300	0.075	0.300	0.22	0.25		Neg
81	177	XJ PH	0.176	0.300	0.157	0.300	0.59	0.52		Neg
82	178	XJ PH	1.023	0.300	1.316	0.300	3.41	4.39	17.72	Both +
83	179	XJ PH	0.080	0.300	0.070	0.300	0.27	0.23		Neg
84	180	XJ PH	0.062	0.300	0.116	0.300	0.21	0.39		Neg
85	181	XJ PH	0.853	0.300	0.463	0.300	2.84	1.54	41.91	Both +
86	182	XJ PH	0.061	0.300	0.092	0.300	0.20	0.31		Neg
87	183	XJ PH	0.055	0.300	0.074	0.300	0.18	0.25		Neg
88	184	XJ PH	0.054	0.300	0.078	0.300	0.18	0.26		Neg
89	185	XJ PH	0.060	0.300	0.074	0.300	0.20	0.25		Neg
90	186	XJ PH	0.060	0.300	0.072	0.300	0.20	0.24		Neg
91	187	XJ PH	0.071	0.300	0.084	0.300	0.24	0.28		Neg
92	188	XJ PH	0.060	0.300	0.080	0.300	0.20	0.27		Neg
93	189	XJ PH	0.095	0.300	0.102	0.300	0.32	0.34		Neg
94	190	XJ PH	0.057	0.300	0.068	0.300	0.19	0.23		Neg
95	191	XJ PH	0.078	0.300	0.071	0.300	0.26	0.24		Neg
5	192	XJ PH	0.104	0.300	0.121	0.300	0.35	0.40		Neg
6	193	XJ PH	0.082	0.300	0.083	0.300	0.27	0.28		Neg
7	194	XJ PH	0.070	0.300	0.089	0.300	0.23	0.30		Neg
8	195	XJ PH	0.119	0.300	0.109	0.300	0.40	0.36		Neg
84	196	XJ PH	0.259	0.300	0.230	0.300	0.86	0.77		Neg
10	197	XJ PH	0.090	0.300	0.096	0.300	0.30	0.32		Neg
11	198	XJ PH	0.084	0.300	0.109	0.300	0.28	0.36		Neg
12	199	XJ PH	0.080	0.300	0.080	0.300	0.27	0.27		Neg
13	200	XJ PH	0.118	0.300	0.141	0.300	0.39	0.47		Neg
14	201	XJ PH	0.060	0.300	0.066	0.300	0.20	0.22		Neg
15	202	XJ PH	0.070	0.300	0.077	0.300	0.23	0.26		Neg
16	203	XJ PH	0.070	0.300	0.084	0.300	0.23	0.28		Neg
17	204	XJ PH	0.065	0.300	0.079	0.300	0.22	0.26		Neg
85	205	XJ PH	0.585	0.300	0.312	0.300	1.95	1.04	43.04	Both +
19	206	XJ PH	0.301	0.300	0.516	0.300	1.00	1.72	37.22	Both +
87	207	XJ PH	0.849	0.300	0.398	0.300	2.83	1.33	51.15	Both +
21	208	XJ PH	0.079	0.300	0.090	0.300	0.26	0.30		Neg
22	209	XJ PH	0.065	0.300	0.072	0.300	0.22	0.24		Neg
23	210	XJ PH	0.135	0.300	0.157	0.300	0.45	0.52		Neg
88	211	XJ PH	0.221	0.300	0.125	0.300	0.74	0.42		Neg
25	212	XJ PH	0.062	0.300	0.069	0.300	0.21	0.23		Neg
26	213	XJ PH	0.067	0.300	0.073	0.300	0.22	0.24		Neg
89	214	XJ PH	2.423	0.300	1.474	0.300	8.08	4.91	34.44	Both +
28	215	XJ PH	0.193	0.300	0.294	0.300	0.64	0.98		Neg

Figure 3I

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
5	216	XJ PH	1.604	0.300	1.215	0.300	5.35	4.05	19.52	Both +
6	217	XJ PH	0.830	0.300	0.619	0.300	2.77	2.06	20.59	Both +
31	218	XJ PH	0.065	0.300	0.077	0.300	0.22	0.26		Neg
32	219	XJ PH	0.070	0.300	0.085	0.300	0.23	0.28		Neg
33	220	XJ PH	0.071	0.300	0.081	0.300	0.24	0.27		Neg
34	221	XJ PH	0.064	0.300	0.064	0.300	0.21	0.21		Neg
35	222	XJ PH	0.080	0.300	0.072	0.300	0.27	0.24		Neg
7	223	XJ PH	0.668	0.300	0.364	0.300	2.23	1.21	41.66	Both +
8	224	XJ PH	0.512	0.300	0.431	0.300	1.71	1.44	12.15	Both +
9	225	XJ PH	1.328	0.300	1.062	0.300	4.43	3.54	15.74	Both +
39	226	XJ PH	0.068	0.300	0.080	0.300	0.23	0.27		Neg
10	227	XJ PH	0.659	0.300	0.547	0.300	2.20	1.82	13.13	Both +
41	228	XJ PH	0.202	0.300	0.286	0.300	0.67	0.95		Neg
42	229	XJ PH	0.068	0.300	0.088	0.300	0.23	0.29		Neg
43	230	XJ PH	0.137	0.300	0.204	0.300	0.46	0.68		Neg
44	231	XJ PH	0.140	0.300	0.250	0.300	0.47	0.83		Neg
45	232	XJ PH	0.210	0.300	0.264	0.300	0.70	0.88		Neg
46	233	XJ PH	0.079	0.300	0.064	0.300	0.26	0.21		Neg
47	234	XJ PH	0.085	0.300	0.072	0.300	0.28	0.24		Neg
48	235	XJ PH	0.069	0.300	0.084	0.300	0.23	0.28		Neg
49	236	XJ PH	0.067	0.300	0.071	0.300	0.22	0.24		Neg
50	237	XJ PH	0.084	0.300	0.093	0.300	0.28	0.31		Neg
51	238	XJ PH	0.078	0.300	0.087	0.300	0.26	0.29		Neg
52	239	XJ PH	0.096	0.300	0.147	0.300	0.32	0.49		Neg
53	240	XJ PH	0.066	0.300	0.082	0.300	0.22	0.27		Neg
15	241	XJ PH	0.762	0.300	0.657	0.300	2.54	2.19	10.46	Both +
55	242	XJ PH	0.068	0.300	0.080	0.300	0.23	0.27		Neg
56	243	XJ PH	0.066	0.300	0.074	0.300	0.22	0.25		Neg
57	244	XJ PH	0.063	0.300	0.069	0.300	0.21	0.23		Neg
58	245	XJ PH	0.065	0.300	0.060	0.300	0.22	0.20		Neg
59	246	XJ PH	0.159	0.300	0.214	0.300	0.53	0.71		Neg
60	247	XJ PH	0.072	0.300	0.072	0.300	0.24	0.24		Neg
61	248	XJ PH	0.103	0.300	0.211	0.300	0.34	0.70		Neg
62	249	XJ PH	0.100	0.300	0.071	0.300	0.33	0.24		Neg
63	250	XJ PH	0.099	0.300	0.142	0.300	0.33	0.47		Neg
64	251	XJ PH	0.073	0.300	0.106	0.300	0.24	0.35		Neg
65	252	XJ PH	0.059	0.300	0.069	0.300	0.20	0.23		Neg
66	253	XJ PH	0.065	0.300	0.077	0.300	0.22	0.26		Neg
67	254	XJ PH	0.064	0.300	0.068	0.300	0.21	0.23		Neg
68	255	XJ PH	0.284	0.300	0.245	0.300	0.95	0.82		Neg
69	256	XJ PH	0.064	0.300	0.069	0.300	0.21	0.23		Neg
70	257	XJ PH	0.063	0.300	0.062	0.300	0.21	0.21		Neg
71	258	XJ PH	0.074	0.300	0.065	0.300	0.25	0.22		Neg
72	259	XJ PH	0.067	0.300	0.071	0.300	0.22	0.24		Neg
73	260	XJ PH	0.102	0.300	0.066	0.300	0.34	0.22		Neg
19	261	XJ PH	0.629	0.300	0.399	0.300	2.10	1.33	31.64	Both +
75	262	XJ PH	0.060	0.300	0.065	0.300	0.20	0.22		Neg
76	263	XJ PH	0.346	0.300	0.551	0.300	1.15	1.84	32.32	Both +
77	264	XJ PH	0.062	0.300	0.065	0.300	0.21	0.22		Neg
78	265	XJ PH	0.077	0.300	0.078	0.300	0.26	0.26		Neg
79	266	XJ PH	0.145	0.300	0.228	0.300	0.48	0.76		Neg
80	267	XJ PH	0.061	0.300	0.069	0.300	0.20	0.23		Neg
81	268	XJ PH	0.152	0.300	0.170	0.300	0.51	0.57		Neg
23	269	XJ PH	0.497	0.300	0.376	0.300	1.66	1.25	19.60	Both +
83	270	XJ PH	0.063	0.300	0.061	0.300	0.21	0.20		Neg
84	271	XJ PH	0.068	0.300	0.064	0.300	0.23	0.21		Neg
85	272	XJ PH	0.071	0.300	0.064	0.300	0.24	0.21		Neg

Figure 3J

anti-HEV EIA			OD				Sample/Coff			
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	Result
86	273	XJ PH	0.072	0.300	0.084	0.300	0.24	0.28		Neg
87	274	XJ PH	0.144	0.300	0.204	0.300	0.48	0.68		Neg
88	275	XJ PH	0.066	0.300	0.066	0.300	0.22	0.22		Neg
89	276	XJ PH	0.070	0.300	0.077	0.300	0.23	0.26		Neg
25	277	XJ PH	0.240	0.300	0.204	0.300	0.80	0.68		Neg
91	278	XJ PH	0.078	0.300	0.074	0.300	0.26	0.25		Neg
92	279	XJ PH	0.078	0.300	0.086	0.300	0.26	0.29		Neg
93	280	XJ PH	0.074	0.300	0.091	0.300	0.25	0.30		Neg
94	281	XJ PH	0.065	0.300	0.069	0.300	0.22	0.23		Neg
26	282	XJ PH	0.481	0.300	0.407	0.341	1.60	1.19	20.72	Both +
5	283	XJ PH	0.070	0.300	0.073	0.341	0.23	0.21		Neg
6	284	XJ PH	0.061	0.300	0.083	0.341	0.20	0.24		Neg
7	285	XJ PH	0.067	0.300	0.076	0.341	0.22	0.22		Neg
27	286	XJ PH	0.366	0.300	0.356	0.341	1.22	1.04	10.99	Both +
9	287	XJ PH	0.085	0.300	0.135	0.341	0.28	0.40		Neg
28	288	XJ PH	0.538	0.300	0.631	0.341	1.79	1.85	2.22	Both +
11	289	XJ PH	0.067	0.300	0.189	0.341	0.22	0.55		Neg
29	290	XJ PH	0.357	0.300	0.321	0.341	1.19	0.94	16.50	sar55 +
13	291	XJ PH	0.112	0.300	0.167	0.341	0.37	0.49		Neg
14	292	XJ PH	0.068	0.300	0.077	0.341	0.23	0.23		Neg
15	293	XJ PH	0.062	0.300	0.062	0.341	0.21	0.18		Neg
30	294	XJ PH	0.255	0.300	0.352	0.341	0.85	1.03		swORF2 +
31	295	XJ PH	0.350	0.300	0.370	0.341	1.17	1.09	5.13	Both +
18	296	XJ PH	0.061	0.300	0.062	0.341	0.20	0.18		Neg
19	297	XJ PH	0.081	0.300	0.062	0.341	0.27	0.18		Neg
20	298	XJ PH	0.062	0.300	0.068	0.341	0.21	0.20		Neg
21	299	XJ PH	0.076	0.300	0.085	0.341	0.25	0.25		Neg
22	300	XJ PH	0.065	0.300	0.057	0.341	0.22	0.17		Neg
23	301	XJ PH	0.064	0.300	0.064	0.341	0.21	0.19		Neg
32	302	XJ PH	0.611	0.300	0.704	0.341	2.04	2.06	0.96	Both +
25	303	XJ PH	0.077	0.300	0.104	0.341	0.26	0.30		Neg
26	304	XJ PH	0.057	0.300	0.060	0.341	0.19	0.18		Neg
27	305	XJ PH	0.060	0.300	0.059	0.341	0.20	0.17		Neg
28	306	XJ PH	0.064	0.300	0.067	0.341	0.21	0.20		Neg
29	307	XJ PH	0.119	0.300	0.209	0.341	0.40	0.61		Neg
30	308	XJ PH	0.075	0.300	0.076	0.341	0.25	0.22		Neg
31	309	XJ PH	0.058	0.300	0.063	0.341	0.19	0.18		Neg
32	310	XJ PH	0.067	0.300	0.061	0.341	0.22	0.18		Neg
33	311	XJ PH	0.061	0.300	0.054	0.341	0.20	0.16		Neg
34	312	XJ PH	0.062	0.300	0.062	0.341	0.21	0.18		Neg
35	313	XJ PH	0.060	0.300	0.060	0.341	0.20	0.18		Neg
36	314	XJ PH	0.064	0.300	0.061	0.341	0.21	0.18		Neg
37	315	XJ PH	0.058	0.300	0.058	0.341	0.19	0.17		Neg
38	316	XJ PH	0.073	0.300	0.065	0.341	0.24	0.19		Neg
39	317	XJ PH	0.060	0.300	0.060	0.341	0.20	0.18		Neg
40	318	XJ PH	0.057	0.300	0.059	0.341	0.19	0.17		Neg
6	319	XJ PH	0.914	0.300	0.695	0.341	3.05	2.04	28.05	Both +
42	320	XJ PH	0.068	0.300	0.064	0.341	0.23	0.19		Neg
43	321	XJ PH	0.083	0.300	0.071	0.341	0.28	0.21		Neg
44	322	XJ PH	0.058	0.300	0.058	0.341	0.19	0.17		Neg
45	323	XJ PH	0.060	0.300	0.058	0.341	0.20	0.17		Neg
46	324	XJ PH	0.072	0.300	0.063	0.341	0.24	0.18		Neg
47	325	XJ PH	0.059	0.300	0.058	0.341	0.20	0.17		Neg
48	326	XJ PH	0.062	0.300	0.073	0.341	0.21	0.21		Neg
49	327	XJ PH	0.058	0.300	0.057	0.341	0.19	0.17		Neg
50	328	XJ PH	0.064	0.300	0.060	0.341	0.21	0.18		Neg
51	329	XJ PH	0.112	0.300	0.119	0.341	0.37	0.35		Neg

Figure 3K

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
7	330	XJ PH	0.455	0.300	0.389	0.341	1.52	1.14	20.00	Both +
53	331	XJ PH	0.070	0.300	0.090	0.341	0.23	0.26		Neg
54	332	XJ PH	0.060	0.300	0.056	0.341	0.20	0.16		Neg
55	333	XJ PH	0.090	0.300	0.075	0.341	0.30	0.22		Neg
56	334	XJ PH	0.089	0.300	0.081	0.341	0.30	0.24		Neg
57	335	XJ PH	0.059	0.300	0.056	0.341	0.20	0.16		Neg
58	336	XJ PH	0.057	0.300	0.055	0.341	0.19	0.16		Neg
8	337	XJ PH	0.464	0.300	0.370	0.341	1.55	1.09	24.81	Both +
60	338	XJ PH	0.106	0.300	0.201	0.341	0.35	0.59		Neg
10	339	XJ PH	1.650	0.300	1.339	0.341	5.50	3.93	23.60	Both +
62	340	XJ PH	0.065	0.300	0.064	0.341	0.22	0.19		Neg
63	341	XJ PH	0.069	0.300	0.062	0.341	0.23	0.18		Neg
11	342	XJ PH	1.433	0.300	1.163	0.341	4.78	3.41	23.60	Both +
65	343	XJ PH	0.073	0.300	0.064	0.341	0.24	0.19		Neg
12	344	XJ PH	0.525	0.300	0.466	0.341	1.75	1.37	17.40	Both +
67	345	XJ PH	0.059	0.300	0.058	0.341	0.20	0.17		Neg
68	346	XJ PH	0.060	0.300	0.062	0.341	0.20	0.18		Neg
13	347	XJ PH	0.301	0.300	0.305	0.341	1.00	0.89	8.12	sar55 +
70	348	XJ PH	0.087	0.300	0.065	0.341	0.29	0.19		Neg
14	349	XJ PH	0.347	0.300	0.317	0.341	1.16	0.93	15.39	sar55 +
72	350	XJ PH	0.062	0.300	0.060	0.341	0.21	0.18		Neg
73	351	XJ PH	0.059	0.300	0.062	0.341	0.20	0.18		Neg
74	352	XJ PH	0.058	0.300	0.056	0.341	0.19	0.16		Neg
15	353	XJ PH	0.695	0.300	0.692	0.341	2.32	2.03	9.35	Both +
76	354	XJ PH	0.059	0.300	0.057	0.341	0.20	0.17		Neg
77	355	XJ PH	0.063	0.300	0.063	0.341	0.21	0.18		Neg
78	356	XJ PH	0.068	0.300	0.070	0.341	0.23	0.21		Neg
79	357	XJ PH	0.060	0.300	0.060	0.341	0.20	0.18		Neg
80	358	XJ PH	0.062	0.300	0.063	0.341	0.21	0.18		Neg
81	359	XJ PH	0.061	0.300	0.058	0.341	0.20	0.17		Neg
82	360	XJ PH	0.060	0.300	0.058	0.341	0.20	0.17		Neg
83	361	XJ PH	0.061	0.300	0.060	0.341	0.20	0.18		Neg
84	362	XJ PH	0.093	0.300	0.138	0.341	0.31	0.40		Neg
85	363	XJ PH	0.060	0.300	0.064	0.341	0.20	0.19		Neg
86	364	XJ PH	0.086	0.300	0.114	0.341	0.29	0.33		Neg
87	365	XJ PH	0.059	0.300	0.058	0.341	0.20	0.17		Neg
16	366	XJ PH	0.757	0.300	0.523	0.341	2.52	1.53	34.50	Both +
89	367	XJ PH	0.064	0.300	0.062	0.341	0.21	0.18		Neg
90	368	XJ PH	0.065	0.300	0.062	0.341	0.22	0.18		Neg
91	369	XJ PH	0.069	0.300	0.067	0.341	0.23	0.20		Neg
92	370	XJ PH	0.061	0.300	0.064	0.341	0.20	0.19		Neg
93	371	XJ PH	0.074	0.300	0.058	0.341	0.25	0.17		Neg
94	372	XJ PH	0.141	0.300	0.185	0.341	0.47	0.54		Neg
95	373	XJ PH	0.062	0.300	0.068	0.341	0.21	0.20		Neg
5	374	XJ PH	0.068	0.300	0.061	0.300	0.23	0.20		Neg
6	375	XJ PH	0.112	0.300	0.088	0.300	0.37	0.29		Neg
7	376	XJ PH	0.068	0.300	0.056	0.300	0.23	0.19		Neg
17	377	XJ PH	0.344	0.300	0.244	0.300	1.15	0.81	24.05	sar55 +
9	378	XJ PH	0.073	0.300	0.056	0.300	0.24	0.19		Neg
10	379	XJ PH	0.117	0.300	0.126	0.300	0.39	0.42		Neg
11	380	XJ PH	0.067	0.300	0.058	0.300	0.22	0.19		Neg
12	381	XJ PH	0.072	0.300	0.058	0.300	0.24	0.19		Neg
13	382	XJ PH	0.072	0.300	0.059	0.300	0.24	0.20		Neg
14	383	XJ PH	0.070	0.300	0.064	0.300	0.23	0.21		Neg
18	384	XJ PH	1.457	0.300	1.085	0.300	4.86	3.62	20.70	Both +
16	385	XJ PH	0.065	0.300	0.057	0.300	0.22	0.19		Neg
17	386	XJ PH	0.069	0.300	0.062	0.300	0.23	0.21		Neg

Figure 3L

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
18	387	XJ PH	0.241	0.300	0.262	0.300	0.80	0.87		Neg
19	388	XJ PH	0.108	0.300	0.113	0.300	0.36	0.38		Neg
20	389	XJ PH	0.072	0.300	0.059	0.300	0.24	0.20		Neg
21	390	XJ PH	0.063	0.300	0.058	0.300	0.21	0.19		Neg
22	391	XJ PH	0.186	0.300	0.295	0.300	0.62	0.98		Neg
23	392	XJ PH	0.066	0.300	0.058	0.300	0.22	0.19		Neg
24	393	XJ PH	0.084	0.300	0.060	0.300	0.28	0.20		Neg
25	394	XJ PH	0.070	0.300	0.065	0.300	0.23	0.22		Neg
26	395	XJ PH	0.228	0.300	0.267	0.300	0.76	0.89		Neg
27	396	XJ PH	0.070	0.300	0.060	0.300	0.23	0.20		Neg
28	397	XJ PH	0.064	0.300	0.056	0.300	0.21	0.19		Neg
29	398	XJ PH	0.068	0.300	0.057	0.300	0.23	0.19		Neg
30	399	XJ PH	0.068	0.300	0.059	0.300	0.23	0.20		Neg
31	400	XJ PH	0.067	0.300	0.059	0.300	0.22	0.20		Neg
22	401	XJ PH	0.610	0.300	0.375	0.300	2.03	1.25	33.74	Both +
33	402	XJ PH	0.063	0.300	0.055	0.300	0.21	0.18		Neg
34	403	XJ PH	0.068	0.300	0.059	0.300	0.23	0.20		Neg
35	404	XJ PH	0.075	0.300	0.060	0.300	0.25	0.20		Neg
36	405	XJ PH	0.069	0.300	0.058	0.300	0.23	0.19		Neg
37	406	XJ PH	0.139	0.300	0.196	0.300	0.46	0.65		Neg
38	407	XJ PH	0.070	0.300	0.065	0.300	0.23	0.22		Neg
39	408	XJ PH	0.115	0.300	0.127	0.300	0.38	0.42		Neg
40	409	XJ PH	0.074	0.300	0.070	0.300	0.25	0.23		Neg
41	410	XJ PH	0.069	0.300	0.070	0.300	0.23	0.23		Neg
42	411	XJ PH	0.070	0.300	0.064	0.300	0.23	0.21		Neg
43	412	XJ PH	0.069	0.300	0.061	0.300	0.23	0.20		Neg
44	413	XJ PH	0.063	0.300	0.057	0.300	0.21	0.19		Neg
45	414	XJ PH	0.066	0.300	0.056	0.300	0.22	0.19		Neg
46	415	XJ PH	0.184	0.300	0.221	0.300	0.61	0.74		Neg
47	416	XJ PH	0.106	0.300	0.124	0.300	0.35	0.41		Neg
48	417	XJ PH	0.073	0.300	0.066	0.300	0.24	0.22		Neg
49	418	XJ PH	0.069	0.300	0.058	0.300	0.23	0.19		Neg
50	419	XJ PH	0.065	0.300	0.055	0.300	0.22	0.18		Neg
51	420	XJ PH	0.063	0.300	0.055	0.300	0.21	0.18		Neg
24	421	XJ PH	1.019	0.300	0.831	0.300	3.40	2.77	14.37	Both +
53	422	XJ PH	0.066	0.300	0.059	0.300	0.22	0.20		Neg
25	423	XJ PH	0.662	0.300	0.532	0.300	2.21	1.77	15.40	Both +
55	424	XJ PH	0.070	0.300	0.056	0.300	0.23	0.19		Neg
56	425	XJ PH	0.065	0.300	0.069	0.300	0.22	0.23		Neg
57	426	XJ PH	0.108	0.300	0.139	0.300	0.36	0.46		Neg
58	427	XJ PH	0.186	0.300	0.212	0.300	0.62	0.71		Neg
27	428	XJ PH	0.658	0.300	0.652	0.300	2.19	2.17	0.65	Both +
60	429	XJ PH	0.078	0.300	0.063	0.300	0.26	0.21		Neg
61	430	XJ PH	0.065	0.300	0.055	0.300	0.22	0.18		Neg
62	431	XJ PH	0.067	0.300	0.056	0.300	0.22	0.19		Neg
63	432	XJ PH	0.071	0.300	0.058	0.300	0.24	0.19		Neg
64	433	XJ PH	0.245	0.300	0.268	0.300	0.82	0.89		Neg
65	434	XJ PH	0.128	0.300	0.171	0.300	0.43	0.57		Neg
66	435	XJ PH	0.069	0.300	0.058	0.300	0.23	0.19		Neg
29	436	XJ PH	0.751	0.300	0.523	0.300	2.50	1.74	25.31	Both +
68	437	XJ PH	0.072	0.300	0.064	0.300	0.24	0.21		Neg
69	438	XJ PH	0.064	0.300	0.055	0.300	0.21	0.18		Neg
70	439	XJ PH	0.065	0.300	0.065	0.300	0.22	0.22		Neg
71	440	XJ PH	0.111	0.300	0.109	0.300	0.37	0.36		Neg
72	441	XJ PH	0.074	0.300	0.060	0.300	0.25	0.20		Neg
73	442	XJ PH	0.108	0.300	0.134	0.300	0.36	0.45		Neg
74	443	XJ PH	0.062	0.300	0.054	0.300	0.21	0.18		Neg

Figure 3M

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
75	444	XJ PH	0.198	0.300	0.216	0.300	0.66	0.73		Neg
76	445	XJ PH	0.065	0.300	0.059	0.300	0.22	0.20		Neg
77	446	XJ PH	0.065	0.300	0.057	0.300	0.22	0.19		Neg
78	447	XJ PH	0.064	0.300	0.059	0.300	0.21	0.20		Neg
79	448	XJ PH	0.066	0.300	0.058	0.300	0.22	0.19		Neg
80	449	XJ PH	0.070	0.300	0.058	0.300	0.23	0.19		Neg
81	450	XJ PH	0.063	0.300	0.057	0.300	0.21	0.19		Neg
82	451	XJ PH	0.081	0.300	0.064	0.300	0.27	0.21		Neg
83	452	XJ PH	0.067	0.300	0.059	0.300	0.22	0.20		Neg
84	453	XJ PH	0.071	0.300	0.060	0.300	0.24	0.20		Neg
31	454	XJ PH	0.821	0.300	0.604	0.300	2.74	2.01	21.54	Both +
86	455	XJ PH	0.100	0.300	0.141	0.300	0.33	0.47		Neg
87	456	XJ PH	0.066	0.300	0.057	0.300	0.22	0.19		Neg
32	457	XJ PH	0.683	0.300	0.576	0.300	2.28	1.92	12.02	Both +
89	458	XJ PH	0.084	0.300	0.074	0.300	0.28	0.25		Neg
90	459	XJ PH	0.066	0.300	0.055	0.300	0.22	0.18		Neg
91	460	XJ PH	0.064	0.300	0.060	0.300	0.21	0.20		Neg
92	461	XJ PH	0.112	0.300	0.116	0.300	0.37	0.39		Neg
93	462	XJ PH	0.227	0.300	0.234	0.300	0.76	0.78		Neg
94	463	XJ PH	0.124	0.300	0.129	0.300	0.41	0.43		Neg
95	464	XJ PH	0.103	0.300	0.215	0.300	0.34	0.72		Neg
5	465	XJ PH	0.066	0.300	0.064	0.300	0.22	0.21		Neg
6	466	XJ PH	0.072	0.300	0.067	0.300	0.24	0.22		Neg
7	467	XJ PH	0.064	0.300	0.057	0.300	0.21	0.19		Neg
8	468	XJ PH	0.066	0.300	0.070	0.300	0.22	0.23		Neg
7	469	XJ PH	0.748	0.300	0.988	0.300	2.49	3.29	19.55	Both +
8	470	XJ PH	0.634	0.300	0.860	0.300	2.11	2.87	21.39	Both +
9	471	XJ PH	0.306	0.300	0.406	0.300	1.02	1.35	19.86	Both +
12	472	XJ PH	0.068	0.300	0.061	0.300	0.23	0.20		Neg
10	473	XJ PH	0.561	0.300	0.783	0.300	1.87	2.61	23.36	Both +
14	474	XJ PH	0.066	0.300	0.058	0.300	0.22	0.19		Neg
15	475	XJ PH	0.072	0.300	0.060	0.300	0.24	0.20		Neg
16	476	XJ PH	0.066	0.300	0.061	0.300	0.22	0.20		Neg
17	477	XJ PH	0.061	0.300	0.056	0.300	0.20	0.19		Neg
18	478	XJ PH	0.135	0.300	0.210	0.300	0.45	0.70		Neg
19	479	XJ PH	0.143	0.300	0.253	0.300	0.48	0.84		Neg
20	480	XJ PH	0.064	0.300	0.057	0.300	0.21	0.19		Neg
21	481	XJ PH	0.131	0.300	0.223	0.300	0.44	0.74		Neg
22	482	XJ PH	0.065	0.300	0.054	0.300	0.22	0.18		Neg
23	483	XJ PH	0.073	0.300	0.058	0.300	0.24	0.19		Neg
24	484	XJ PH	0.069	0.300	0.065	0.300	0.23	0.22		Neg
25	485	XJ PH	0.069	0.300	0.066	0.300	0.23	0.22		Neg
26	486	XJ PH	0.083	0.300	0.067	0.300	0.28	0.22		Neg
27	487	XJ PH	0.076	0.300	0.069	0.300	0.25	0.23		Neg
28	488	XJ PH	0.067	0.300	0.062	0.300	0.22	0.21		Neg
29	489	XJ PH	0.071	0.300	0.056	0.300	0.24	0.19		Neg
30	490	XJ PH	0.084	0.300	0.084	0.300	0.28	0.28		Neg
31	491	XJ PH	0.068	0.300	0.060	0.300	0.23	0.20		Neg
32	492	XJ PH	0.065	0.300	0.062	0.300	0.22	0.21		Neg
33	493	XJ PH	0.081	0.300	0.085	0.300	0.27	0.28		Neg
34	494	XJ PH	0.064	0.300	0.058	0.300	0.21	0.19		Neg
35	495	XJ PH	0.064	0.300	0.064	0.300	0.21	0.21		Neg
36	496	XJ PH	0.071	0.300	0.061	0.300	0.24	0.20		Neg
37	497	XJ PH	0.065	0.300	0.058	0.300	0.22	0.19		Neg
38	498	XJ PH	0.069	0.300	0.081	0.300	0.23	0.27		Neg
39	499	XJ PH	0.178	0.300	0.241	0.300	0.59	0.80		Neg
40	500	XJ PH	0.066	0.300	0.065	0.300	0.22	0.22		Neg

Figure 3N

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
41	501	XJ PH	0.074	0.300	0.061	0.300	0.25	0.20		Neg
42	502	XJ PH	0.124	0.300	0.145	0.300	0.41	0.48		Neg
43	503	XJ PH	0.061	0.300	0.058	0.300	0.20	0.19		Neg
44	504	XJ PH	0.062	0.300	0.057	0.300	0.21	0.19		Neg
45	505	XJ PH	0.074	0.300	0.060	0.300	0.25	0.20		Neg
46	506	XJ PH	0.067	0.300	0.058	0.300	0.22	0.19		Neg
15	507	XJ PH	1.467	0.300	1.103	0.300	4.89	3.68	20.03	Both +
48	508	XJ PH	0.067	0.300	0.059	0.300	0.22	0.20		Neg
49	509	XJ PH	0.102	0.300	0.141	0.300	0.34	0.47		Neg
50	510	XJ PH	0.061	0.300	0.063	0.300	0.20	0.21		Neg
51	511	XJ PH	0.099	0.300	0.129	0.300	0.33	0.43		Neg
52	512	XJ PH	0.064	0.300	0.057	0.300	0.21	0.19		Neg
53	513	XJ PH	0.059	0.300	0.057	0.300	0.20	0.19		Neg
54	514	XJ PH	0.059	0.300	0.054	0.300	0.20	0.18		Neg
55	515	XJ PH	0.076	0.300	0.098	0.300	0.25	0.33		Neg
56	516	XJ PH	0.062	0.300	0.058	0.300	0.21	0.19		Neg
57	517	XJ PH	0.059	0.300	0.056	0.300	0.20	0.19		Neg
58	518	XJ PH	0.061	0.300	0.054	0.300	0.20	0.18		Neg
59	519	XJ PH	0.066	0.300	0.063	0.300	0.22	0.21		Neg
60	520	XJ PH	0.064	0.300	0.058	0.300	0.21	0.19		Neg
61	521	XJ PH	0.062	0.300	0.058	0.300	0.21	0.19		Neg
62	522	XJ PH	0.099	0.300	0.116	0.300	0.33	0.39		Neg
63	523	XJ PH	0.068	0.300	0.061	0.300	0.23	0.20		Neg
64	524	XJ PH	0.089	[illegible]	0.076	0.300	0.30	0.25		Neg
65	525	XJ PH	0.064	[illegible]	0.065	0.300	0.21	0.22		Neg
66	526	XJ PH	0.060	0.300	0.058	0.300	0.20	0.19		Neg
67	527	XJ PH	0.062	0.300	0.058	0.300	0.21	0.19		Neg
68	528	XJ PH	0.062	0.300	0.057	0.300	0.21	0.19		Neg
69	529	XJ PH	0.067	0.300	0.057	0.300	0.22	0.19		Neg
70	530	XJ PH	0.063	0.300	0.055	0.300	0.21	0.18		Neg
71	531	XJ PH	0.063	0.300	0.058	0.300	0.21	0.19		Neg
72	532	XJ PH	0.073	0.300	0.056	0.300	0.24	0.19		Neg
73	[illegible]33	XJ PH	0.069	0.300	0.060	0.300	0.23	0.20		Neg
74	[illegible]34	XJ PH	0.069	0.300	0.059	0.300	0.23	0.20		Neg
75	535	XJ PH	0.067	0.300	0.058	0.300	0.22	0.19		Neg
76	536	XJ PH	0.067	0.300	0.058	0.300	0.22	0.19		Neg
77	553	XJ PH	0.066	0.300	0.062	0.300	0.22	0.21		Neg
78	554	XJ PH	0.062	0.300	0.059	0.300	0.21	0.20		Neg
79	555	XJ PH	0.122	0.300	0.159	0.300	0.41	0.53		Neg
80	556	XJ PH	0.062	0.300	0.056	0.300	0.21	0.19		Neg
81	557	XJ PH	0.063	0.300	0.058	0.300	0.21	0.19		Neg
82	558	XJ PH	0.090	0.300	0.070	0.300	0.30	0.23		Neg
83	559	XJ PH	0.101	0.300	0.083	0.300	0.34	0.28		Neg
84	560	XJ PH	0.088	0.300	0.073	0.300	0.29	0.24		Neg
85	561	XJ PH	0.072	0.300	0.062	0.300	0.24	0.21		Neg
86	562	XJ PH	0.075	0.300	0.080	0.300	0.25	0.27		Neg
87	563	XJ PH	0.06[illegible]	0.300	0.059	0.300	0.21	0.20		Neg
88	564	XJ PH	0[illegible]	300	0.057	0.300	0.22	0.19		Neg
89	565	XJ PH	0[illegible]	00	0.057	0.300	0.22	0.19		Neg
90	566	XJ PH	0.[illegible]	3	0.059	0.300	0.22	0.20		Neg
91	567	XJ PH	0.073	0.300	0.058	0.300	0.24	0.19		Neg
92	568	XJ PH	0.071	0.300	0.062	0.300	0.24	0.21		Neg
93	569	XJ PH	0.177	0.300	0.211	0.300	0.59	0.70		Neg
17	570	XJ PH	0.623	0.300	0.500	0.300	2.08	1.67	15.49	Both +
95	571	XJ PH	0.068	0.300	0.060	0.300	0.23	0.20		Neg
5	572	XJ PH	0.067	0.300	0.071	0.300	0.22	0.24		Neg
6	573	XJ PH	0.101	0.300	0.075	0.300	0.34	0.25		Neg

Figure 30

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
7	574	XJ PH	0.068	0.300	0.063	0.300	0.23	0.21		Neg
8	575	XJ PH	0.077	0.300	0.068	0.300	0.26	0.23		Neg
9	576	XJ PH	0.071	0.300	0.062	0.300	0.24	0.21		Neg
10	577	XJ PH	0.169	0.300	0.133	0.300	0.56	0.44		Neg
11	578	XJ PH	0.195	0.300	0.152	0.300	0.65	0.51		Neg
12	579	XJ PH	0.079	0.300	0.065	0.300	0.26	0.22		Neg
13	580	XJ PH	0.155	0.300	0.147	0.300	0.52	0.49		Neg
14	581	XJ PH	0.062	0.300	0.062	0.300	0.21	0.21		Neg
15	582	XJ PH	0.123	0.300	0.109	0.300	0.41	0.36		Neg
16	583	XJ PH	0.069	0.300	0.063	0.300	0.23	0.21		Neg
17	584	XJ PH	0.163	0.300	0.146	0.300	0.54	0.49		Neg
18	585	XJ PH	0.154	0.300	0.131	0.300	0.51	0.44		Neg
19	586	XJ PH	0.080	0.300	0.071	0.300	0.27	0.24		Neg
20	587	XJ PH	0.069	0.300	0.060	0.300	0.23	0.20		Neg
21	588	XJ PH	0.078	0.300	0.067	0.300	0.26	0.22		Neg
18	589	XJ PH	1.895	0.300	1.486	0.300	6.32	4.95	17.11	Both +
23	590	XJ PH	0.103	0.300	0.076	0.300	0.34	0.25		Neg
24	591	XJ PH	0.074	0.300	0.061	0.300	0.25	0.20		Neg
25	592	XJ PH	0.069	0.300	0.063	0.300	0.23	0.21		Neg
26	593	XJ PH	0.071	0.300	0.062	0.300	0.24	0.21		Neg
27	594	XJ PH	0.070	0.300	0.063	0.300	0.23	0.21		Neg
19	595	XJ PH	0.456	0.300	0.335	0.300	1.52	1.12	21.63	Both +
29	596	XJ PH	0.066	0.300	0.062	0.300	0.22	0.21		Neg
30	597	XJ PH	0.090	0.300	0.064	0.300	0.30	0.21		Neg
31	598	XJ PH	0.064	0.300	0.060	0.300	0.21	0.20		Neg
32	599	XJ PH	0.069	0.300	0.061	0.300	0.23	0.20		Neg
33	600	XJ PH	0.075	0.300	0.060	0.300	0.25	0.20		Neg
34	601	XJ PH	0.211	0.300	0.167	0.300	0.70	0.56		Neg
35	602	XJ PH	0.097	0.300	0.066	0.300	0.32	0.22		Neg
36	603	XJ PH	0.067	0.300	0.062	0.300	0.22	0.21		Neg
37	604	XJ PH	0.069	0.300	0.063	0.300	0.23	0.21		Neg
38	605	XJ PH	0.072	0.300	0.063	0.300	0.24	[illegible]		Neg
39	606	XJ PH	0.080	0.300	0.072	0.300	0.27	[illegible]		Neg
40	607	XJ PH	0.064	0.300	0.071	0.300	0.21	0.24		Neg
41	608	XJ PH	0.080	0.300	0.072	0.300	0.27	0.24		Neg
42	609	XJ PH	0.069	0.300	0.066	0.300	0.23	0.22		Neg
21	610	XJ PH	0.462	0.300	0.074	0.300	1.54	0.25	102.37	sar55 +
44	611	XJ PH	0.071	0.300	0.062	0.300	0.24	0.21		Neg
45	612	XJ PH	0.089	0.300	0.069	0.300	0.30	0.23		Neg
46	613	XJ PH	0.076	0.300	0.066	0.300	0.25	0.22		Neg
47	614	XJ PH	0.085	0.300	0.067	0.300	0.28	0.22		Neg
48	615	XJ PH	0.074	0.300	0.073	0.300	0.25	0.24		Neg
49	616	XJ PH	0.114	0.300	0.192	0.300	0.38	0.64		Neg
50	617	XJ PH	0.068	0.300	0.063	0.300	0.23	0.21		Neg
51	618	XJ PH	0.086	0.300	0.072	0.300	0.29	0.24		Neg
52	619	XJ PH	0.066	0.300	0.058	0.300	0.22	0.19		Neg
53	620	XJ PH	0.067	0.300	0.062	0.300	0.22	0.21		Neg
54	621	XJ PH	0.063	0.300	0.057	0.300	0.21	0.19		Neg
55	622	XJ PH	0.065	0.300	0.068	0.300	0.22	0.23		Neg
56	623	XJ PH	0.085	0.300	0.076	0.300	0.28	0.25		Neg
57	624	XJ PH	0.082	0.300	0.065	0.300	0.27	0.22		Neg
58	625	XJ PH	0.279	0.300	0.215	0.300	0.93	0.72		Neg
59	626	XJ PH	0.092	0.300	0.063	0.300	0.31	0.21		Neg
60	627	XJ PH	0.070	0.300	0.197	0.300	0.23	0.66		Neg
23	628	XJ PH	0.540	0.300	0.466	0.300	1.80	1.55	10.40	Both +
62	629	XJ PH	0.074	0.300	0.064	0.300	0.25	0.21		Neg
63	630	XJ PH	0.085	0.300	0.076	0.300	0.28	0.25		Neg

Figure 3P

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
64	631	XJ PH	0.106	0.300	0.101	0.300	0.35	0.[illegible]		Neg
65	632	XJ PH	0.065	0.300	0.060	0.300	0.22	0.20		Neg
66	633	XJ PH	0.078	0.300	0.074	0.300	0.26	0.25		Neg
67	634	XJ PH	0.061	0.300	0.063	0.300	0.20	0.21		Neg
68	635	XJ PH	0.067	0.300	0.063	0.300	0.22	0.21		Neg
69	636	XJ PH	0.081	0.300	0.067	0.300	0.27	0.22		Neg
70	637	XJ PH	0.084	0.300	0.062	0.300	0.28	0.21		Neg
71	638	XJ PH	0.099	0.300	0.076	0.300	0.33	0.25		Neg
72	639	XJ PH	0.085	0.300	0.079	0.300	0.28	0.26		Neg
73	640	XJ PH	0.087	0.300	0.074	0.300	0.29	0.25		Neg
74	641	XJ PH	0.068	0.300	0.065	0.300	0.23	0.22		Neg
75	642	XJ PH	0.073	0.300	0.063	0.300	0.24	0.21		Neg
76	643	XJ PH	0.063	0.300	0.061	0.300	0.21	0.20		Neg
77	644	XJ PH	0.068	0.300	0.066	0.300	0.23	0.22		Neg
78	645	XJ PH	0.066	0.300	0.068	0.300	0.22	0.23		Neg
79	646	XJ PH	0.074	0.300	0.064	0.300	0.25	0.21		Neg
80	647	XJ PH	0.075	0.300	0.068	0.300	0.25	0.23		Neg
81	648	XJ PH	0.071	0.300	0.063	0.300	0.24	0.21		Neg
82	[illegible]		0.086	0.300	0.060	0.300	0.29	0.20		Neg
83	[illegible]		[illegible]	0.300	0.066	0.300	0.31	0.22		Neg
84	651	[illegible]	0.072	0.300	0.068	0.300	0.24	0.23		Neg
85	652	XJ PH	0.071	0.300	0.066	0.300	0.24	0.22		Neg
86	653	XJ PH	0.081	0.300	0.064	0.300	0.27	0.21		Neg
[illegible]	[illegible]	XJ PH	0.074	0.300	0.065	0.300	0.25	0.22		Neg
[illegible]	[illegible]	XJ PH	0.065	0.300	0.061	0.300	0.22	0.20		Neg
[illegible]	656	XJ PH	0.062	0.300	0.059	0.300	0.21	0.20		Neg
90	657	XJ PH	0.075	0.300	0.067	0.300	0.25	0.22		Neg
91	658	XJ PH	0.075	0.300	0.064	0.300	0.25	0.21		Neg
92	659	XJ PH	0.088	0.300	0.075	0.300	0.29	0.25		Neg
24	660	XJ PH	0.538	0.300	0.513	0.300	1.79	1.71	3.36	Both +
94	661	XJ PH	0.097	0.300	0.067	0.300	0.32	0.22		Neg
95	662	XJ PH	0.104	0.300	0.095	0.300	0.35	0.32		Neg
25	663	XJ PH	0.225	0.300	0.169	0.300	0.75	0.56		Neg
6	664	XJ PH	0.063	0.300	0.054	0.300	0.21	0.18		Neg
7	665	XJ PH	0.090	0.300	0.066	0.300	0.30	0.22		Neg
8	666	XJ PH	0.172	0.300	0.110	0.300	0.57	0.37		Neg
9	667	XJ PH	0.063	0.300	0.058	0.300	0.21	0.19		Neg
10	668	XJ PH	0.060	0.300	0.055	0.300	0.20	0.18		Neg
11	669	XJ PH	0.086	0.300	0.073	0.300	0.29	0.24		Neg
12	670	XJ PH	0.080	0.300	0.058	0.300	0.27	0.19		Neg
13	671	XJ PH	0.148	0.300	0.053	0.300	0.49	0.18		Neg
14	672	XJ PH	0.090	0.300	0.057	0.300	0.30	0.19		Neg
15	673	XJ PH	0.061	0.300	0.057	0.300	0.20	0.19		Neg
16	674	XJ PH	0.080	0.300	0.066	0.300	0.27	0.22		Neg
17	675	XJ PH	0.096	0.300	0.064	0.300	0.32	0.21		Neg
18	676	XJ PH	0.058	0.300	0.053	0.300	0.19	0.18		Neg
19	677	XJ PH	0.064	0.300	0.057	0.300	0.21	0.19		Neg
20	678	XJ PH	0.071	0.300	0.058	0.300	0.24	0.19		Neg
21	679	XJ PH	0.104	0.300	0.066	0.300	0.35	0.22		Neg
22	680	XJ PH	0.105	0.300	0.079	0.300	0.35	0.26		Neg
23	681	XJ PH	0.065	0.300	0.058	0.300	0.22	0.19		Neg
24	682	XJ PH	0.071	0.300	0.055	0.300	0.24	0.18		Neg
25	683	XJ PH	0.073	0.300	0.056	0.300	0.24	0.19		Neg
26	684	XJ PH	0.067	0.300	0.054	0.300	0.22	0.18		Neg
27	685	XJ PH	0.097	0.300	0.070	0.300	0.32	0.23		Neg
28	686	XJ PH	0.085	0.300	0.073	0.300	0.28	0.24		Neg
29	687	XJ PH	0.061	0.300	0.055	0.300	0.20	0.18		Neg

Figure 3Q

anti-HEV EIA			OD				Sample/Coff			Result
Name	SampleDate		humSAR55	coff	swORF2	coff	humSAR55	swORF2	%CV	
30	688	XJ PH	0.078	0.300	0.069	0.300	0.26	0.23		Neg
31	689	XJ PH	0.072	0.300	0.055	0.300	0.24	0.18		Neg
32	690	XJ PH	0.082	0.300	0.058	0.300	0.27	0.19		Neg
33	691	XJ PH	0.065	0.300	0.057	0.300	0.22	0.19		Neg
34	692	XJ PH	0.099	0.300	0.075	0.300	0.33	0.25		Neg
35	693	XJ PH	0.058	0.300	0.054	0.300	0.19	0.18		Neg
36	694	XJ PH	0.074	0.300	0.059	0.300	0.25	0.20		Neg
37	695	XJ PH	0.090	0.300	0.066	0.300	0.30	0.22		Neg
38	696	XJ PH	0.071	0.300	0.058	0.300	0.24	0.19		Neg
39	697	XJ PH	0.090	0.300	0.077	0.300	0.30	0.26		Neg
40	698	XJ PH	0.085	0.300	0.058	0.300	0.28	0.19		Neg
41	699	XJ PH	0.058	0.300	0.055	0.300	0.19	0.18		Neg
26	700	XJ PH	0.399	0.300	0.483	0.300	1.33	1.61	13.47	Both +
43	701	XJ PH	0.059	0.300	0.054	0.300	0.20	0.18		Neg
44	702	XJ PH	0.068	0.300	0.061	0.300	0.23	0.20		Neg
45	703	XJ PH	0.067	0.300	0.056	0.300	0.22	0.19		Neg
46	704	XJ PH	0.078	0.300	0.060	0.300	0.26	0.20		Neg
47	705	XJ PH	0.260	0.300	0.176	0.300	0.87	0.59		Neg
48	706	XJ PH	0.065	0.300	0.055	0.300	0.22	0.18		Neg
49	707	XJ PH	0.060	0.300	0.063	0.300	0.20	0.21		Neg
50	708	XJ PH	0.075	0.300	0.060	0.300	0.25	0.20		Neg
51	709	XJ PH	0.243	0.300	0.174	0.300	0.81	0.58		Neg
52	710	XJ PH	0.063	0.300	0.067	0.300	0.21	0.22		Neg
53	711	XJ PH	0.068	0.300	0.055	0.300	0.23	0.18		Neg
29	712	XJ PH	0.416	0.300	0.260	0.300	1.39	0.87	32.64	sar55 +
55	713	XJ PH	0.088	0.300	0.072	0.300	0.29	0.24		Neg
56	714	XJ PH	0.070	0.300	0.057	0.300	0.23	0.19		Neg
57	715	XJ PH	0.057	0.300	0.052	0.300	0.19	0.17		Neg
58	716	XJ PH	0.065	0.300	0.058	0.300	0.22	0.19		Neg
59	717	XJ PH	0.062	0.300	0.053	0.300	0.21	0.18		Neg
60	718	XJ PH	0.064	0.300	0.054	0.300	0.21	0.18		Neg
61	719	XJ PH	0.072	0.300	0.056	0.300	0.24	0.19		Neg
62	720	XJ PH	0.061	0.300	0.055	0.300	0.20	0.18		Neg

Figure 3R

Overall		Sar55		
		Neg	Pos	Total
SwORF	Neg	765	7	772
	Pos	6	104	110
	Total	771	111	882
			κ=	0.938

Foreign Pig Handlers		Sar55		
		Neg	Pos	Total
SwORF	Neg	6	0	6
	Pos	0	12	12
	Total	6	12	18
			κ=	1.000

Foreign Blood Donors		Sar55		
		Neg	Pos	Total
SwORF	Neg	26	0	26
	Pos	0	5	5
	Total	26	5	31
			κ=	1.000

Local Blood Donors		Sar55		
		Neg	Pos	Total
SwORF	Neg	194	1	195
	Pos	5	30	35
	Total	199	31	230
			κ=	0.894

US Pig Handlers/Workers		Sar55		
		Neg	Pos	Total
SwORF	Neg	539	6	545
	Pos	1	57	58
	Total	540	63	603
			κ=	0.936

FIG. 4

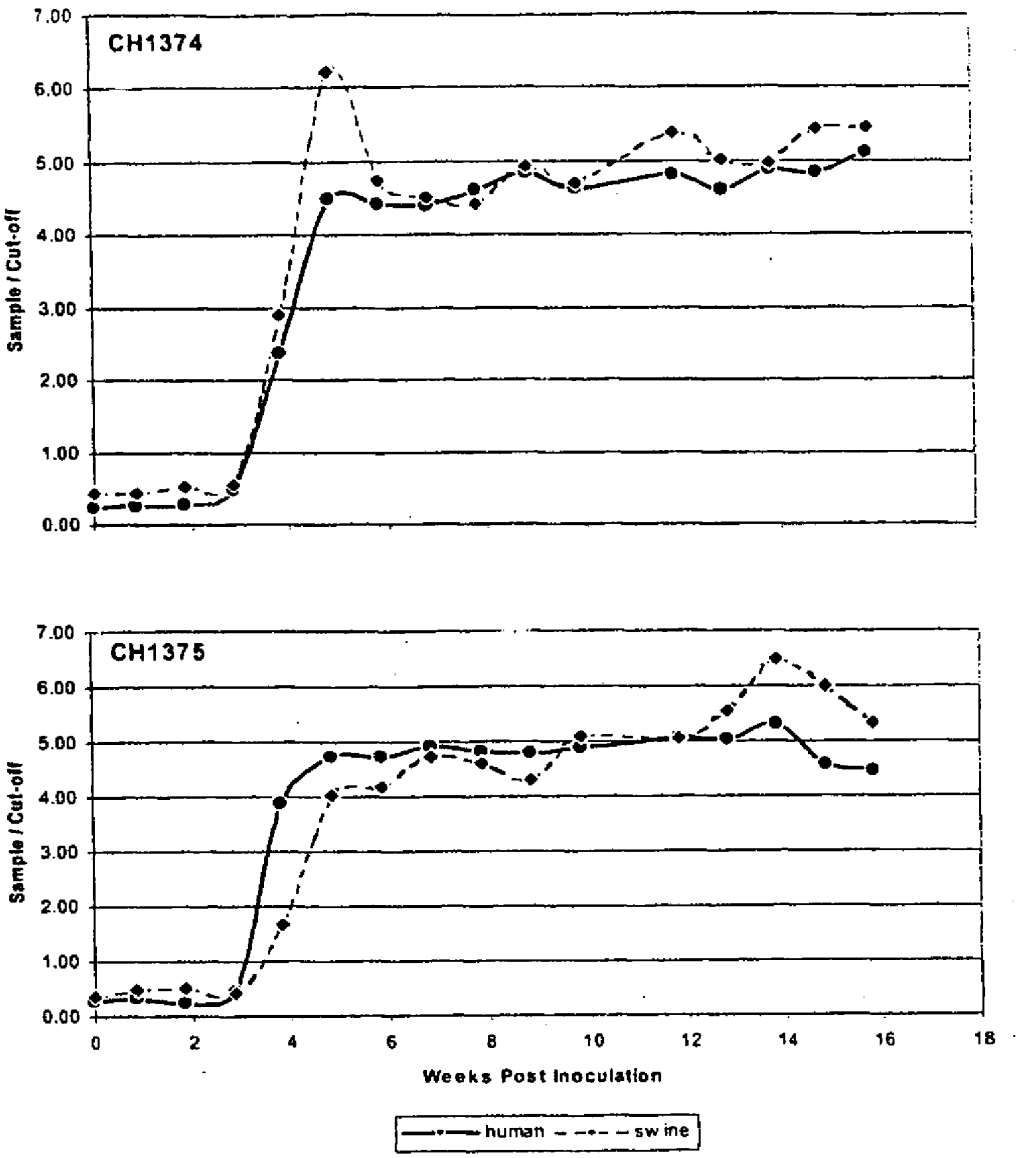
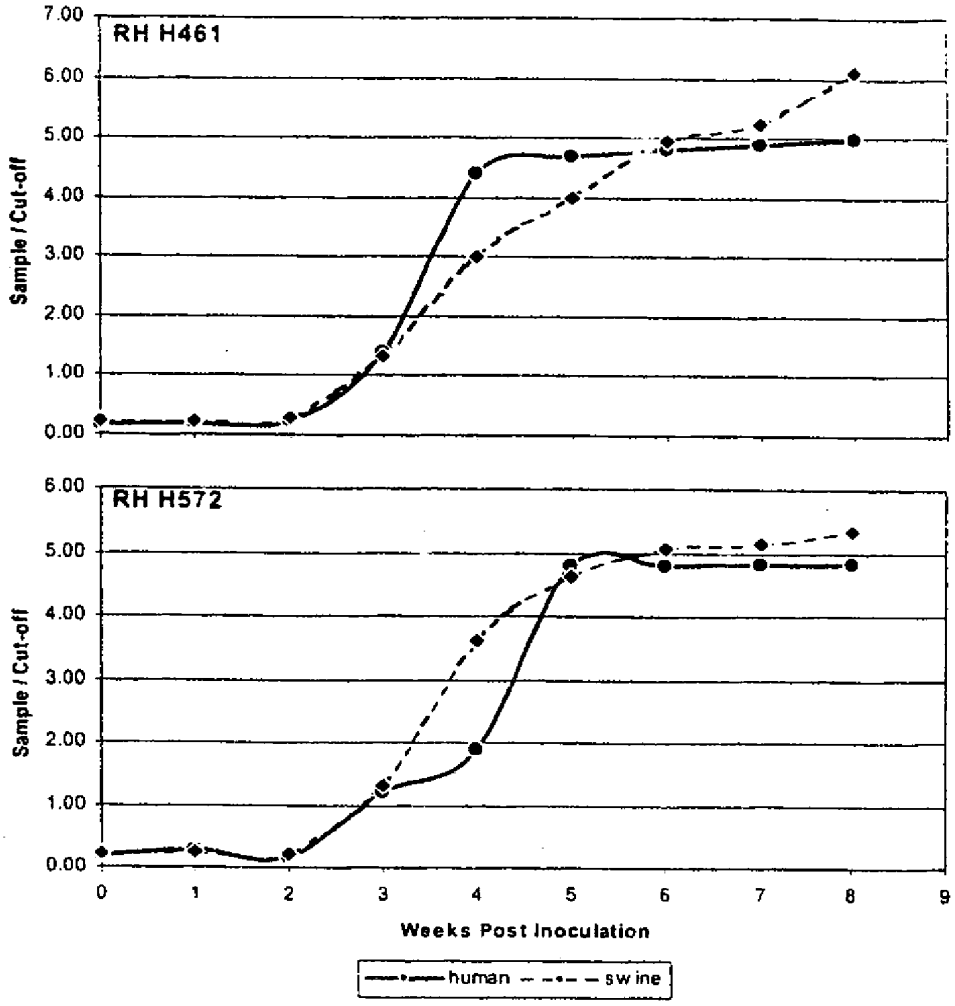


FIG. 5



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(71) Applicant *(for all designated States except US)*: **THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES** [US/US]; National Institutes of Health, Office of Technology Transfer, Suite 325, 6011 Executive Boulevard, Rockville, MD 20852 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **MENG, Xiang-Jin** [CN/US]; 401 Craig Drive, Blacksburg, VA 24060 (US). **PURCELL, Robert, H.** [US/US]; 17517 White Grounds Road, Boyds, MD 20814 (US). **EMERSON, Suzanne, U.** [US/US]; 4517 Everett Street, Kensington, MD 20895 (US).

(74) Agent: **ALTMAN, Daniel , E.**; Knobbe, Martens, Olson and Bear, LLP, 2040 Main Street, Fourteenth Floor, Irvine, CA 92614 (US).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 02/089733 A3

(54) Title: RECOMBINANT ORF2 PROTEINS OF THE SWINE HEPATITIS E VIRUS AND THEIR USE AS A VACCINE AND AS A DIAGNOSTIC REAGENT FOR MEDICAL AND VETERINARY APPLICATIONS

(57) Abstract: The invention relates to open reading frame 2 (ORF-2) proteins of a swine hepatitis E virus and the use of these proteins as an antigen in diagnostic immunoassays and/or as immunogen or vaccine to protect against infection by hepatitis E.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/14100

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : C07K 17/00; A61K 39/00, 39/29
US CL : 424/186.1, 189.1, 225.1, 228.1; 530/350
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 424/186.1, 189.1, 225.1, 228.1; 530/350

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99/04029 A2 (MENG et al.) 28 January 1999 (28.01.1999), claims 1, 3, 5-15, 24, 26-28, 30	1, 3, 5, 7, 9, 11, 13-15, 26, 31
A	MENG et al. A novel virus in swine is closely related to the human hepatitis E virus. [illegible], USA. September 1997, Vol 94, pages 9860-9865, especially Figure 4 on page 9864.	1, 3, 5, 7, 9, 11, 13-15, 26, 31

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
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Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703)305-3230

Authorized officer
Shannon Foley
Telephone No. (703) 308-0196

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/14100

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claim Nos.: 2,4,6,8,10,12,27-30 and 32
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claims 2, 4, 6, 8, 10, 12, 27-30 and 32 could not be searched because no computer readable form of the sequence listing was submitted.

3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1, 3, 5, 7, 9, 11, 13-15, 26 and 31

Remark on Protest
☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid. If applicant pays no additional fees, Group I, claims 1-15 and 26-32 will be examined.

Group I, claim(s) 1-, 3, 5, 7, 9, 11, 13-15, 26 and 31, drawn to HEV ORF2 protein, a DNA molecule, kit, first method of making, and first method of using the protein as a vaccine.

Group II, claim(s) 16-19, drawn to a method of detecting antibodies.

Group III, claim(s) 20 and 21, drawn to antibodies.

Group IV, claim(s) 22 and 23, drawn to a method of detecting HEV using the HEV ORF2 protein.

Group V, claim(s) 24 and 25, drawn to a method of making antibodies.

The inventions listed as Groups I-V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature of group I is the HEV ORF2 protein, a DNA molecule encoding the protein, the first method of making the protein and the first method of using the protein as a vaccine. Any product or subsequent methods using the same or different products lack unity of invention because they do not share a special technical feature with the first group.
Group II is drawn to a second method of using the first product. The special technical feature of this group is a method of detecting antibodies. This method does not share the special technical feature with the first group because the method of group II requires different method steps from those in group I.
Group III is drawn to a second product. The special technical feature of this group is antibodies. This group does not share a special technical feature with group I because the products do not share a common structure or activity.
Group IV is drawn to a first method of using the second product. The special technical feature of this group is a method of detection, which does not share the special technical feature with Group I because the method does not require the products or the method steps of Group I.
Group V is drawn to a third method of using the first product. The special technical feature of this group is a method of making antibodies, which does not require the same method steps required in Group I.

Continuation of B. FIELDS SEARCHED Item 3:
USPatFull, EPO, JPO, Derwent, USPGpub, medline, crubase, biosis, vetu
search terms: hepatitis E virus, HEV, Porcine Reproductive and Respiratory Syndrome Virus, PRRSV, Mystery Swine Disease, Lelystad, ORF 2, open reading frame 2, pig, swine, porcine